

# **CA/T Traffic Signal Optimization Study**

## **Recommendations Report**

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## Background

At the request of the Boston Transportation Department (BTD), Howard/Stein-Hudson Associates (HSH) has compiled data on existing traffic volumes and operations at 81 signalized intersections located around the Central Artery region within the City of Boston. These data include signal timing and phasing, vehicle, bicycle, and pedestrian counts, crash data, and travel time studies. This information was used to develop new signal timings to help reduce delays and travel times at the different locations and to help improve safety, where possible. This report documents the methodologies used to create the new signal timings and the results of proposed conditions analysis.

## Study Area

The study area consists of 81 signalized intersections

- Pearl Street/Atlantic Avenue;
- Pearl Street/Purchase Street;
- Seaport Boulevard/Atlantic Avenue;
- Oliver Street/ Purchase Street;
- High Street/Atlantic Avenue;
- High Street/Purchase Street;
- Broad Street/Purchase Street;
- East India Row/Atlantic Avenue;
- India Street/Surface Artery Southbound (SASB);
- Milk Street/Atlantic Avenue;
- Milk Street/SASB;
- State Street/Atlantic Avenue;
- State Street/SASB;
- Mercantile Street/Atlantic Avenue/Cross Street;
- Mercantile Street/SASB;
- Commercial Street/Cross Street;
- Clinton Street/SASB;
- Kneeland Street/SASB;
- Beach Street/SASB;
- Essex Street/Lincoln Street/SASB;
- Essex Street/South Street;
- Summer Street/Purchase Street/SASB;
- Congress Street/Purchase Street;
- Kneeland Street/Lincoln Street;
- North Street/SASB;
- North Street/Cross Street;
- Hanover Street/SASB;
- Hanover Street/Cross Street;
- New Sudbury Street/SASB;
- New Sudbury Street/Cross Street;
- New Chardon Street/SASB;
- North Washington Street/Cross Street;
- North Washington Street/Beverly Street;
- Valenti Way/Beverly Street;
- Valenti Way/ North Washington Street;

- Congress Street/Atlantic Avenue;
- Summer Street/Atlantic Avenue;
- Essex Street/Atlantic Avenue;
- Beach Street/Atlantic Avenue;
- Kneeland Street/Atlantic Avenue/I-93 Ramps;
- North Street/Clinton Street;
- Purchase Street/Fire Station;
- State Street/Congress Street/Devonshire Street;
- North Street/Congress Street;
- North Street/Union Street;
- Hanover Street/Congress Street;
- New Sudbury Street/Congress Street/Merrimac Street;
- New Chardon Street/Merrimac Street;
- Summer Street/Dorchester Avenue;
- Summer Street/Melcher Street;
- Summer Street/Pump House Road;
- Massport Haul Road/Pump Station Connector;
- Summer Street/D Street;
- Ramp DB (I-90 WB On Ramp)/D Street;
- Transitway/D Street;
- Congress Street/D Street;
- Congress Street/B Street/Ramps D & F;
- Congress Street/East Service Road/Ramps I & C;
- Congress Street/Boston Wharf Road;
- Seaport Boulevard(Northern Avenue)/B Street;
- Seaport Boulevard/East Service Road;
- Seaport Boulevard/Sleeper Street;
- Congress Street/Dorchester Avenue;
- Congress Street/A Street;
- Summer Street/West Side Drive;
- Summer Street/World Trade Center (WTC) Avenue;
- Seaport Boulevard/Boston Wharf Road;
- South Station Connector (SSCONN)/Albany Street;
- Broadway Bridge/Frontage Road;
- Bennington Street/Neptune Road;
- SSCONN/Ramps K&X;
- East Berkeley Street/Albany Street & West 4<sup>th</sup> Street/Frontage Road NB;
- Traveler Street/Albany Street;
- Herald Street/Albany Street;
- Albany Street/Frontage Road SB;
- Ramp A2/Ramp I/Frontage Road SB;
- Martha Road/Nashua Street;
- Rutherford Avenue/North Washington Street/Chelsea Street;
- Rutherford Avenue/LT-TL;
- Albany Street Extension/Frontage Road NB; and
- Neptune Road/Route 1A Off-ramp.

Existing Conditions Reports have been completed and accepted by BTB on May 23, 2009.

## Existing Conditions Analysis

### *Data Collection*

HSH took 11-hour manual turning movement counts for vehicles, bicycles, and pedestrian for all of the above intersections on Tuesdays, Wednesdays, or Thursday on non-holidays between November 2008 and March 2009. Existing turning movement diagrams and pedestrian diagrams can be found in **Appendix A**.

HSH also conducted an on-street parking inventory and survey of the study area. On-street parking was recorded as well as irregular parking maneuvers noted.

BTD provided all signal timings and offsets used in the Existing Conditions analysis. In addition, HSH conducted several field visits to check signal phasing and existing “Walk” and “Flashing Don’t Walk” pedestrian timings.

### *Crash Analysis*

HSH compiled motor vehicle crash data for all study area intersections from the Massachusetts Highway Department (MassHighway) Crash Records System for the most recent 3-year period for which they are available (2004–06).

**Table 1** summarizes the number of crashes and the crash rates for all study area intersections over a 3-year period. West 4<sup>th</sup> Street/Frontage Road NB (60 crashes) had the most crashes over a 3-year period. The crash rates for these intersections were determined based on the number of crashes per million vehicles entering the intersection. At Congress Street/Dorchester Street, a reported crash involved a pedestrian and resulted in an injury.

**Table 1. MassHighway Crash History**

Intersection	2004	2005	2006	Total Crashes	Crash Rate	District 4 Crash Rate
Pearl Street/Atlantic Avenue	0	0	1	1	0.05	0.88
Pearl Street/Purchase Street	0	1	0	1	0.05	
Seaport Boulevard/Atlantic Avenue	0	4	8	12	0.35	
Oliver Street/ Purchase Street	0	2	0	2	0.06	
High Street/Atlantic Avenue	0	0	1	1	0.08	
High Street/Purchase Street	0	1	2	3	0.19	
Broad Street/Purchase Street	0	0	1	1	0.08	
East India Row/Atlantic Avenue	0	0	0	0	0.00	
India Street/Surface Artery Southbound (SASB)	0	0	0	0	0.00	
Milk Street/Atlantic Avenue	3	2	0	5	0.36	
Milk Street/SASB	0	1	1	2	0.18	
State Street/Atlantic Avenue	1	0	1	1	0.14	
State Street/SASB	0	0	0	0	0.00	
Mercantile Street/Atlantic Avenue/Cross Street	3	5	1	9	0.57	
Mercantile Street/SASB	0	0	1	1	0.08	
Commercial Street/Cross Street	0	0	0	0	0.00	
Clinton Street/SASB	0	2	2	4	0.33	
Kneeland Street/SASB	8	12	15	35	1.05	
Beach Street/SASB	2	2	0	4	0.24	
Essex Street/Lincoln Street/SASB	0	4	5	9	0.33	
Essex Street/South Street	0	1	0	1	0.16	
Summer Street/Purchase Street/SASB	1	7	1	9	0.40	
Congress Street/Purchase Street	6	18	8	32	0.95	
Kneeland Street/Lincoln Street	2	3	4	9	0.48	
North Street/SASB	0	1	2	3	0.24	
North Street/Cross Street	1	0	2	3	0.18	
Hanover Street/SASB	0	1	0	1	0.12	
Hanover Street/Cross Street	1	2	1	4	0.21	
New Sudbury Street/SASB	0	0	2	2	0.13	
New Sudbury Street/Cross Street	1	0	2	3	0.14	
New Chardon Street/SASB	0	2	1	3	0.09	
North Washington Street/Cross Street	1	1	0	2	0.15	
North Washington Street/Beverly Street	0	0	0	0	0.00	
Valenti Way/Beverly Street	0	0	0	0	0.00	
Valenti Way/ North Washington Street	1	2	1	4	0.14	
Congress Street/Atlantic Avenue	4	7	5	16	0.61	
Summer Street/Atlantic Avenue	1	6	11	18	0.74	
Essex Street/Atlantic Avenue	0	2	2	4	0.29	
Beach Street/Atlantic Avenue	1	2	2	5	0.46	
Kneeland Street/Atlantic Avenue/I-93 Ramps	0	4	7	11	0.73	
North Street/Clinton Street	1	3	0	4	0.40	
Purchase Street/Fire Station	0	0	0	0	0.00	

Table 1. (cont.) MassHighway Crash History

Intersection	2004	2005	2006	Total Crashes	Crash Rate	District 4 Crash Rate
State Street/Congress Street/Devonshire Street	7	6	2	18	0.77	0.88
North Street/Congress Street	4	5	6	15	0.66	
North Street/Union Street	0	0	1	1	0.07	
Hanover Street/Congress Street	1	0	0	1	0.05	
New Sudbury Street/Congress Street/Merrimac Street	4	6	3	13	0.49	
New Chardon Street/Merrimac Street	7	4	3	14	0.50	
Summer Street/Dorchester Avenue	4	7	4	15	0.72	
Summer Street/Melcher Street	0	1	1	2	0.12	
Summer Street/Pump House Road	0	0	0	0	0.00	
Massport Haul Road/Pump Station Connector	0	0	0	0	0.00	
Summer Street/D Street	2	7	10	19	0.77	
Ramp DB (I-90 WB On Ramp)/D Street	0	1	1	2	0.10	
Transitway/D Street	0	1	2	3	0.17	
Congress Street/D Street	2	3	4	9	0.41	
Congress Street/B Street/Ramps D & F	2	1	3	6	0.25	
Congress Street/East Service Road/Ramps I & C	1	1	0	2	0.14	
Congress Street/Boston Wharf Road	1	0	0	1	0.07	
Seaport Boulevard(Northern Avenue)/B Street	0	2	2	4	0.19	
Seaport Boulevard/East Service Road	0	1	1	2	0.08	
Seaport Boulevard/Sleeper Street	2	2	3	7	0.17	
Congress Street/Dorchester Avenue	2	2	3	7	0.49	
Congress Street/A Street	0	0	3	3	0.21	
Summer Street/West Side Drive	1	2	1	4	0.29	
Summer Street/WTC Avenue	2	2	2	6	0.38	
Seaport Boulevard/Boston Wharf Road	1	0	0	1	0.06	
SSCONN/Albany Street	0	0	0	0	0.00	
Broadway Bridge/Frontage Road NB	10	20	23	53	2.16	
Bennington Street/Neptune Road	0	8	7	15	0.74	
SSCONN/Ramps K&X	0	0	0	0	0.00	
East Berkeley Street/Albany Street	4	5	2	12	0.56	
West 4th Street/Frontage Road NB	22	13	25	60	2.32	
Traveler Street/Albany Street	5	3	3	11	0.54	
Herald Street/Albany Street	0	4	11	15	0.61	
Albany Street/Frontage Road SB	0	0	1	1	0.05	
Ramp A2/Ramp I/Frontage Road SB	0	0	3	3	0.14	
Martha Road/Nashua Street	0	0	0	0	0.00	
Rutherford Avenue/North Washington Street/Chelsea Street	4	3	8	15	0.30	
Rutherford Avenue/LT-TL	1	0	0	1	0.02	
Albany Street Ext./Frontage Road NB	7	9	6	22	0.93	
Neptune Road/Route 1A Off-ramp	0	2	1	3	0.18	

Five of the intersections in the study area exceeded the MassHighway District 4 crash rate of 0.88 crashes per million entering vehicles. These locations are Kneeland Street/SASB (1.05), Congress Street/Purchase Street (0.95), West 4<sup>th</sup> Street/Frontage Road NB (2.32), Broadway Bridge/Frontage Road NB (2.16), and Albany Street Extension/Frontage Road NB (0.93). **Table 2** summarizes the crash data received from MassHighway for those locations.

**Table 2. MassHighway Crash Data Summary**

Scenario	# of Crashes				
	Kneeland Street/SASB	Congress/Purchase	W. 4 <sup>th</sup> /Frontage	Broadway/Frontage	Albany Street Ext./ Frontage Road NB
<b>Year</b>					
2004	8	10	22	10	7
2005	12	20	13	20	9
2006	15	23	25	23	6
<b>Type</b>					
Single vehicle	2	1	0	0	3
Angle	6	7	42	37	9
Rear-end	4	8	5	10	2
Rear-to-rear	0	0	0	0	0
Head-on	1	0	0	0	0
Sideswipe	12	11	8	3	7
Unknown/other	10	5	5	3	1
<b>Severity</b>					
Property damage only	23	22	35	29	18
Personal injury	7	5	23	22	4
Fatality	0	0	0	0	0
Hit and run	0	0	0	0	0
Unknown	5	5	2	2	0
<b>Total</b>	<b>35</b>	<b>32</b>	<b>60</b>	<b>53</b>	<b>22</b>

Of the 25 known crashes at Kneeland Street/SASB, 12 were classified as sideswipe, same direction. Sideswipe crashes occurring between vehicles traveling in the same direction are most likely due to vehicles trying to maneuver around traffic that is waiting to make a left turn at approach. Also 6 of those 25 crashes were classified as Angle crashes. These are most commonly caused by drivers accepting gaps that are too small to safely make a left turn. HSH examined clearance times and clarity of signals at this location.

11 out of 27 known crashes at Congress Street/Purchase Street were sideswipe same direction. 7 out of the 27 were angle crashes and 8 out of the 27 were rear-end crashes. At this intersection, the sideswipe crashes are most likely caused by cars attempting to maneuver to or away from the I-90 on-ramp on the far side of Purchase Street southbound approach. With advanced warning through signage and pavement markings, these crashes could be minimized. Angle crashes typically occur when a vehicle making a left turn does not have an adequate gap in oncoming traffic. However, the traffic signal is set up to give each approach its own phase at this intersection. Rear-end crashes are commonly caused by poor clearance timing, or signal faces that are out of the cone of vision causing last minute lane change reactions. HSH examined the clearance times at this location for Phase 1 improvements.

Of the 55 known crashes at West 4<sup>th</sup> Street/Frontage Road NB, 42 were classified as angle crashes. Angle

crashes typically occur on two-way streets when a vehicle making a left turn does not have an adequate gap in oncoming traffic. However, both West 4<sup>th</sup> Street and Frontage Road are one-way streets at this intersection. It is likely that these crashes are caused by signals that are not clearly visible, causing some vehicles to run red indications. Not having sufficient clearance time for the vehicles could also be a factor. Currently, right-turn-on-red is not allowed on the westbound approach due to sight distance restrictions. Some crashes could be caused by vehicles that violate this.

Of the 50 known crashes at Broadway Bridge/Frontage Road NB, 37 were classified as angle crashes. Since each phase is set up to prevent conflicting movements, visibility and clearance times are likely to be a factor. HSH examined both the clearance timing and do a field review of the vehicle indications.

Of the 21 known crashed at Albany Street Extension/Frontage Road NB, 9 were classified as angle crashes. HSH examined the clearance timing and did a field review of the vehicle indications.

### ***Signal Warrant Analysis***

Based on Chapter 4C of the 2003 *Manual on Uniform Traffic Control Devices (MUTCD)* and existing volumes, HSH performed a traffic signal warrant analysis at every intersection in the study to determine if a traffic signal is still warranted. Warrant 3–Peak Hour was examined for all locations, even though the *MUTCD* states that it should be used only in unusual circumstances. Warrant 4–Pedestrian Volume and Warrant 5–School Crossing could not be completed for any location, because a gap study would be needed to satisfy the warrant. Warrant 5 also requires the counting of students, but the counts taken for this study included all pedestrians. Warrant 5 was only considered for locations that are within ¼-mile of a primary or secondary school. Warrant 6–Coordinated Signal System is not applicable at locations that are within 1000 feet of existing traffic signals. Although HSH entered the data into all of the worksheets, Warrant 7–Crash Experience is not applicable at any of the locations under study, because its purpose is to determine unsignalized locations that would expect to see a decrease in crashes due to the installation of a traffic signal. **Table 3** shows the results of the signal warrant analysis.



**Table 3. Signal Warrant Analysis Results**

<b>Warrant</b>								
<b>Intersection</b>	<b>8-hour</b>	<b>4-hour</b>	<b>Peak-hour</b>	<b>Pedestrian Volume</b>	<b>School Crossing</b>	<b>Coordinated Signal System</b>	<b>Crash Experience</b>	<b>Roadway Network</b>
Pearl Street/Atlantic Avenue	n/a	n/a	n/a	No	n/a	n/a	No	n/a
Pearl Street/Purchase Street	Yes	No	No	Yes*	n/a	n/a	No	Yes
Seaport Boulevard/Atlantic Avenue	Yes	Yes	Yes	Yes*	n/a	n/a	Yes**	Yes
Oliver Street/ Purchase Street	No	Yes	Yes	Yes*	n/a	n/a	No	Yes
High Street/Atlantic Avenue	No	No	No	Yes*	n/a	n/a	No	No
High Street/Purchase Street	Yes	No	No	Yes*	n/a	n/a	No	No
Broad Street/Purchase Street	No	No	No	Yes*	n/a	n/a	No	No
East India Row/Atlantic Avenue	No	No	No	No	n/a	n/a	No	No
India Street/SASB	No	No	No	Yes*	n/a	n/a	No	No
Milk Street/Atlantic Avenue	No	No	No	Yes*	n/a	n/a	No	No
Milk Street/SASB	No	No	No	Yes*	n/a	n/a	No	No
State Street/Atlantic Avenue	No	No	No	Yes*	n/a	n/a	No	No
State Street/SASB	Yes	Yes	Yes	Yes*	n/a	n/a	No	Yes
Mercantile Street/Atlantic Avenue/Cross Street	No	No	No	Yes*	n/a	n/a	No	No
Mercantile Street/SASB	No	No	Yes	No	n/a	n/a	No	Yes
Commercial Street/Cross Street	No	No	No	Yes*	n/a	n/a	No	No
Clinton Street/SASB	Yes	Yes	Yes	Yes*	n/a	n/a	No	Yes
Kneeland Street/SASB	Yes	Yes	Yes	No	n/a	n/a	Yes**	Yes
Beach Street/SASB	Yes	No	No	Yes*	n/a	n/a	No	No
Essex Street/Lincoln Street/SASB	Yes	Yes	Yes	Yes*	n/a	n/a	Yes**	Yes
Essex Street/South Street	n/a	n/a	n/a	Yes*	n/a	n/a	No	n/a
Summer Street/Purchase Street/SASB	Yes	Yes	Yes	Yes*	n/a	n/a	No	Yes
Congress Street/Purchase Street	Yes	Yes	Yes	Yes*	n/a	n/a	Yes**	Yes
Kneeland Street/Lincoln Street	Yes	Yes	Yes	No	n/a	n/a	No	No
North Street/SASB	No	Yes	Yes	Yes*	n/a	n/a	No	Yes
North Street/Cross Street	No	Yes	Yes	Yes*	n/a	n/a	No	Yes
Hanover Street/SASB	No	No	No	Yes*	n/a	n/a	No	No
Hanover Street/Cross Street	No	No	Yes	Yes*	n/a	n/a	No	No
New Sudbury Street/SASB	No	No	No	Yes*	n/a	n/a	No	No
New Sudbury Street/Cross Street	Yes	Yes	Yes	Yes*	n/a	n/a	No	No
New Chardon Street/SASB	Yes	Yes	Yes	No	n/a	n/a	No	Yes
North Washington Street/Cross Street	No	No	No	No	n/a	n/a	No	No
North Washington Street/Beverly Street	Yes	Yes	Yes	No	n/a	n/a	No	No
Valenti Way/Beverly Street	n/a	n/a	n/a	No	n/a	n/a	No	n/a
Valenti Way/ North Washington Street	n/a	n/a	n/a	Yes*	n/a	n/a	No	n/a

Table 4. (cont.) Signal Warrant Analysis Results

<b>Warrant</b>								
<b>Intersection</b>	<b>8-hour</b>	<b>4-hour</b>	<b>Peak-hour</b>	<b>Pedestrian Volume</b>	<b>School Crossing</b>	<b>Coordinated Signal System</b>	<b>Crash Experience</b>	<b>Roadway Network</b>
Congress Street/Atlantic Avenue	No	Yes	Yes	Yes*	n/a	n/a	Yes**	Yes
Summer Street/Atlantic Avenue	Yes	Yes	Yes	Yes*	n/a	n/a	Yes**	Yes
Essex Street/Atlantic Avenue	No	Yes	Yes	Yes*	n/a	n/a	No	Yes
Beach Street/Atlantic Avenue	n/a	n/a	n/a	Yes*	n/a	n/a	No	n/a
Kneeland Street/Atlantic Avenue/I-93 Ramps	No	No	Yes	Yes*	n/a	n/a	Yes**	Yes
North Street/Clinton Street	Yes	No	No	Yes*	n/a	n/a	No	No
Purchase Street/Fire Station	No	No	No	No	n/a	n/a	No	No
State Street/Congress Street/Devonshire Street	Yes	Yes	Yes	Yes*	n/a	n/a	Yes**	Yes
North Street/Congress Street	Yes	Yes	Yes	Yes*	n/a	n/a	Yes**	No
North Street/Union Street	n/a	n/a	n/a	Yes*	n/a	n/a	No	No
Hanover Street/Congress Street	No	No	No	Yes*	n/a	n/a	No	No
New Sudbury Street/Congress Street/ Merrimac Street	Yes	Yes	Yes	Yes*	n/a	n/a	No	No
New Chardon Street/Merrimac Street	Yes	Yes	Yes	Yes*	n/a	n/a	No	Yes
Summer St./Dorchester Ave.	Yes	Yes	Yes	Yes*	n/a	n/a	No	No
Summer St./Melcher St.	Yes	Yes	Yes	Yes*	n/a	n/a	No	No
Summer St./Pump House Rd.	Yes	No	Yes	No	n/a	n/a	No	No
Massport Haul Rd./ Pump Station Connector	No	No	No	No	n/a	n/a	No	No
Summer St./D St.	Yes	Yes	Yes	No	n/a	n/a	Yes**	Yes
Ramp DB/D St.	n/a	n/a	n/a	No	n/a	n/a	No	n/a
Transitway/D St.	No	No	No	No	n/a	n/a	No	No
Congress St./D St.	No	No	Yes	No	n/a	n/a	No	Yes
Congress St./B St./Ramps D & F	No	Yes	Yes	No	n/a	n/a	No	Yes
Congress St./East Service Rd./ Ramps I & C	No	No	Yes	No	n/a	n/a	No	No
Congress St./Boston Wharf Rd.	No	No	Yes	No	n/a	n/a	No	No
Seaport Blvd.(Northern Ave.)/B St.	Yes	Yes	Yes	Yes*	n/a	n/a	No	No
Seaport Blvd./East Service Rd.	Yes	Yes	Yes	No	n/a	n/a	No	No
Seaport Blvd./Sleeper St.	No	Yes	Yes	No	n/a	n/a	No	No
Congress St./Dorchester Ave.	Yes	Yes	Yes	No	n/a	n/a	No	No
Congress St./A St.	Yes	Yes	Yes	No	n/a	n/a	No	No
Summer St./West Side Dr.	No	No	No	No	n/a	n/a	No	No
Summer St./ World Trade Center Ave.	No	No	No	Yes*	n/a	n/a	No	No
Seaport Blvd./Boston Wharf Rd.	No	No	No	No	n/a	n/a	No	No

Table 4. (cont.) Signal Warrant Analysis Results

<b>Warrant</b>								
<b>Intersection</b>	<b>8-hour</b>	<b>4-hour</b>	<b>Peak-hour</b>	<b>Pedestrian Volume</b>	<b>School Crossing</b>	<b>Coordinated Signal System</b>	<b>Crash Experience</b>	<b>Roadway Network</b>
SSCONN/Albany Street	No	No	No	No	n/a	n/a	No	No
Broadway Bridge/Frontage Road NB	Yes	Yes	Yes	No	n/a	n/a	Yes**	Yes
Bennington Street/Neptune Road	Yes	Yes	Yes	No	n/a	n/a	Yes**	No
SSCONN/Ramps K&X	No	No	No	No	n/a	n/a	No	No
East Berkeley Street/Albany Street	Yes	Yes	Yes	No	n/a	n/a	No	Yes
West 4 <sup>th</sup> Street/Frontage Road NB	Yes	Yes	Yes	No	n/a	n/a	No	Yes
Traveler Street/Albany Street	Yes	Yes	Yes	No	n/a	n/a	No	No
Herald Street/Albany Street	Yes	Yes	Yes	No	n/a	n/a	Yes**	No
Albany Street/Frontage Road SB	Yes	Yes	Yes	No	n/a	n/a	No	Yes
Ramp A2/Ramp I/Frontage Road SB	Yes	Yes	Yes	No	n/a	n/a	No	Yes
Martha Road/Nashua Street	No	No	Yes	Yes*	n/a	n/a	Yes**	Yes
Rutherford Avenue/North Washington Street/Chelsea Street	Yes	Yes	Yes	No	n/a	n/a	Yes**	Yes
Rutherford Avenue/LT-TL	Yes	Yes	Yes	No	n/a	n/a	No	Yes
Albany Street Extension/Frontage Road NB	Yes	Yes	Yes	No	n/a	n/a	Yes**	Yes
Neptune Road/Route 1A Off-ramp	No	Yes	Yes	No	n/a	n/a	No	No

\*A gap study is necessary to complete this warrant.

\*\* Intersection exceeds warrant minimum of 5 crashes per 12 months but is currently signalized. Based on traffic volumes, HSH does not recommend removing traffic signals to decrease crash rates.

Of the 81 intersections, 11 of them do not meet any of the signal warrants. Pearl Street/Atlantic Avenue did not meet any of the warrants, but was very close to meeting the pedestrian warrant. During the count period, 3 of the highest pedestrian hours had more than 100 pedestrians. The next highest hour had only 94 pedestrians cross the major road. It is likely that this intersection would meet the pedestrian warrant if counted on another day.

North Washington Street/Cross Street did not meet any of the signal warrants. However, the intersection was likely signalized because of the relatively high pedestrian volumes crossing the I-93 ramp. Valenti Way/Beverly Street does not meet any of the signal warrants and is currently running on a flashing red indication. Purchase Street/Fire Station is signalized to give emergency vehicles priority. The signal gives Purchase Street all green time unless there is emergency pre-emption.

Although Transitway/D Street did not meet any of the signal warrants, the intersection is currently signalized to allow MBTA Silver Line buses to cross the intersection.

SSCONN/Albany Street and SSONN/Ramps K&X are likely signalized due to sight distance issues.

Signal warrant worksheets appear in **Appendix B**.

## *Synchro Analysis*

The Synchro analysis for Existing Conditions was structured to match the existing traffic operations as closely as possible. Existing geometries were used for all approaches, and No Turn on Red restrictions were put in place at all relevant locations. Conflicting pedestrian settings were used at all locations that have a pedestrian phase that runs concurrent with a vehicle turn; pedestrian calls per hour settings were used at locations that had an exclusive pedestrian phase. HSH used heavy vehicle percentage, peak-hour factors, and the central business district factor at all locations. Vehicle speeds reflected posted speed limits at all locations. Vehicle clearance times, minimum and maximum green times, extension times, recall, and other controller settings were all taken from the signal schedules provided by BTM.

**Table 4** shows the adjustment factors used in the analysis.

**Table 4. Adjustment Factors Used in the Synchro Analysis**

<b>Adjustment Factor</b>	<b>Used in Analysis?</b>	<b>Notes</b>
Lane widths	Yes	Measured in field
Area type	Yes	CBD at all locations
Right turn on red	Yes	Based on field restrictions
Conflicting peds	Yes	At locations with concurrent pedestrian crossings
Conflicting bikes	No	
Peak-hour factor	Yes	From turning movement counts
Heavy vehicle %	Yes	From turning movement counts
Bus blockages/hour	Yes	At locations that had buses that block a travel lane
Adjacent parking lane	Yes	Based on field notes
Parking maneuvers/hour	No	

At Seaport Boulevard (Northern Avenue)/B Street, adjustments were made to the lane usage to reflect field observations. While the eastbound Seaport Boulevard approach is marked and signed as a through lane and an exclusive right-turn lane, vehicles often use the right-turn lane as a through lane because there are 2 receiving lanes on the east side of the intersection. Therefore, HSH modeled the eastbound approach as a through lane and a shared through/right-turn lane.

At Seaport Boulevard/Sleeper Street, the left-most lane on the eastbound approach appears to be a de facto left-turn lane during both the morning and mid-day peak hours. While normally the approach would be adjusted to show the de facto lane as an exclusive turn lane, HSH has opted to keep the current lane usage as a shared left-turn/through lane, an exclusive through lane, and a right-turn lane. This lane usage most accurately depicts the existing delay and level of service at this intersection.

**Table 5** through **Table 7** show the results of the Existing Conditions analysis. The Synchro analysis can be found on the CD-ROM that accompanies this memo. Existing Operations Schedules can be found in **Appendix C**.

Table 5. Existing (2008) Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Pearl Street/Atlantic Avenue</b>	<b>A</b>	<b>2.8</b>		
Atlantic WB left/thru   thru   thru	A	2.8	0.43	m72
<b>Pearl Street/Purchase Street</b>	<b>C</b>	<b>30.1</b>		
Pearl WB left	E	66.8	0.35	59
Pearl WB left/thru   thru	E	73.2	0.70	130
Purchase SB thru   thru   thru/right	B	19.0	0.55	m185
<b>Seaport Boulevard/Atlantic Avenue</b>	<b>F</b>	<b>114.9</b>		
Seaport EB left/thru   thru	F	265.7	0.91	m382
Seaport WB thru/bear right	E	78.3	0.93	197
Seaport WB bear right/right	D	47.4	0.57	149
Seaport WB right	B	11.7	0.71	45
Atlantic NB left/bear left	D	47.7	0.93	#452
Atlantic NB left/thru   thru/right	C	34.5	0.94	#433
<b>Oliver Street/Purchase Street</b>	<b>F</b>	<b>132.4</b>		
Oliver WB left/thru   thru	F	90.5	1.09	m#177
Purchase SB thru   thru   thru/right	D	50.2	0.89	#263
I-93 SWB left	F	263.5	0.98	#941
I-93 SWB thru   right	D	45.1	0.86	#440
<b>High Street/Atlantic Avenue</b>	<b>B</b>	<b>17.2</b>		
High EB left   left	D	41.0	0.27	66
Atlantic NB thru   thru	B	12.8	0.47	162
<b>High Street/Purchase Street</b>	<b>A</b>	<b>8.9</b>		
High EB thru   thru/right	B	13.1	0.38	56
Purchase SB left/thru   thru   thru	A	7.9	0.51	40
<b>Broad Street/Purchase Street</b>	<b>A</b>	<b>9.5</b>		
Broad EB right	A	0.8	0.18	0
Purchase SB thru   thru   thru/right	B	10.0	0.40	333
<b>East India Row/Atlantic Avenue</b>	<b>A</b>	<b>3.0</b>		
East India WB thru/right	C	23.3	0.25	41
Atlantic NB left/thru   thru/right	A	1.9	0.37	56
<b>India Street/SASB</b>	<b>A</b>	<b>8.1</b>		
India WB left   left	C	32.0	0.45	79
India WB thru	C	32.1	0.35	70
SASB SB thru   thru   thru/right	A	3.0	0.34	90
<b>Milk Street/Atlantic Avenue</b>	<b>C</b>	<b>22.3</b>		
Milk EB left   left	C	25.9	0.20	m36
Milk EB thru	E	61.0	0.75	163
Milk WB right	A	0.1	0.03	0
Atlantic NB thru   thru/right	B	10.7	0.47	177
<b>Milk Street/SASB</b>	<b>C</b>	<b>21.3</b>		
Milk EB thru   thru/right	C	21.8	0.22	51
SASB SB left/thru   thru   thru	C	21.3	0.61	204
<b>State Street/Atlantic Avenue</b>	<b>B</b>	<b>12.8</b>		
State WB thru/right	B	19.2	0.20	34
Atlantic NB left/thru   thru   thru/right	B	12.2	0.28	160

Table 5. (cont.) Existing (2008) Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/SASB</b>	<b>C</b>	<b>24.5</b>		
State WB left	D	46.2	0.22	50
State WB thru   thru	D	45.4	0.36	85
SASB SB thru   thru   thru/right	C	21.5	0.80	442
<b>Mercantile Street/Atlantic Avenue/Cross Street</b>	<b>C</b>	<b>21.3</b>		
Mercantile EB left/thru   thru	D	46.1	0.35	87
Atlantic WB thru   thru/right	D	36.5	0.54	122
Atlantic NB left/thru   thru	A	6.7	0.18	26
Atlantic NB right	A	2.0	0.29	0
<b>Mercantile Street/SASB</b>	<b>F</b>	<b>81.8</b>		
Mercantile WB left   left	C	21.4	0.52	61
SASB SB left/thru   thru   thru	F	92.6	0.58	m185
<b>Commercial Street/Cross Street</b>	<b>A</b>	<b>1.5</b>		
Commercial WB right	A	0.3	0.10	0
Cross NB thru   thru	A	1.8	0.18	10
<b>Clinton Street/SASB</b>	<b>F</b>	<b>120.5</b>		
I-93 WB left	E	68.5	1.00	#562
I-93 WB left/thru	E	70.4	1.01	#611
SASB SB thru   thru   thru/right	F	173.1	0.84	273
<b>Kneeland Street/SASB</b>	<b>E</b>	<b>64.1</b>		
Kneeland EB thru   thru	D	45.0	0.66	158
Kneeland EB right	A	9.0	0.41	51
Kneeland WB left	C	20.7	0.38	m76
Kneeland WB thru   thru	F	136.7	0.77	382
SASB SB left/thru   thru   thru/right	A	5.8	0.43	48
<b>Beach Street/SASB</b>	<b>A</b>	<b>4.6</b>		
Beach WB left	D	36.5	0.35	m75
SASB SB thru   thru   thru	A	2.0	0.28	21
<b>Essex Street/Lincoln Street/SASB</b>	<b>D</b>	<b>36.8</b>		
Essex EB left/thru   thru	E	69.5	0.97	#313
Essex EB right/hard right	B	19.1	0.42	96
SASB SB left/thru   thru   thru/right	B	13.8	0.47	174
I-93 Ramp NWB left/thru   thru   thru/right	D	38.2	0.73	193
<b>Essex Street/South Street</b>	<b>A</b>	<b>6.8</b>		
Essex EB thru   thru/right	A	2.9	0.29	m4
South WB left   left	D	35.6	0.18	m24
<b>Summer Street/Purchase Street/SASB</b>	<b>D</b>	<b>45.2</b>		
Summer EB thru	D	46.5	0.40	85
Summer EB right	B	13.9	0.24	20
Summer WB left	D	44.4	0.83	m#207
Summer WB left/thru   thru	D	53.1	0.94	m#275
Purchase SB left/thru   thru/right	D	47.5	0.90	#271
I-90 off-ramp SWB left/thru   thru/right	D	37.5	0.68	235

Table 5. (cont.) Existing (2008) Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/Purchase Street</b>	<b>C</b>	<b>22.5</b>		
Congress EB thru   thru   thru/right	C	24.3	0.41	135
Congress EB right	C	26.0	0.34	132
Purchase SB hard left	C	23.7	0.73	282
Purchase SB left/thru   thru	B	19.7	0.74	248
<b>Kneeland Street/Lincoln Street</b>	<b>C</b>	<b>24.7</b>		
Kneeland EB left/thru   thru/right	C	24.1	0.72	203
Kneeland WB left/thru   thru   thru/right	C	26.4	0.79	m161
Lincoln NB left/thru   thru	C	29.1	0.63	#514
Lincoln NB right	A	5.5	0.34	71
<b>North Street/SASB</b>	<b>B</b>	<b>18.1</b>		
North Street EB right	A	4.8	0.05	20
I-93 WB left/thru   thru	A	8.3	0.56	240
SASB SB thru   thru/right	D	44.8	0.82	173
<b>North Street/Cross Street</b>	<b>C</b>	<b>29.3</b>		
I-93 EB left	B	16.3	0.39	205
I-93 EB left/thru	B	16.6	0.42	207
Cross NB thru   thru/right	D	46.2	0.79	181
<b>Hanover Street/SASB</b>	<b>B</b>	<b>14.6</b>		
Hanover EB thru   thru/right	C	28.8	0.05	10
Hanover WB left	C	24.5	0.15	56
Hanover WB thru	C	27.9	0.26	132
SASB SB left/thru   thru/right	A	6.8	0.33	m53
<b>Hanover Street/Cross Street</b>	<b>A</b>	<b>6.9</b>		
Hanover EB left	D	42.7	0.12	16
Hanover EB thru	D	41.3	0.10	31
Hanover WB thru/right	C	27.2	0.60	71
Cross NB left/thru   thru/right	A	2.2	0.42	41
<b>New Sudbury Street/SASB</b>	<b>D</b>	<b>43.3</b>		
New Sudbury EB thru   thru	B	11.1	0.14	59
New Sudbury EB right	A	3.0	0.21	22
SASB SB left/thru   thru	E	57.3	0.70	181
Haymarket Station SEB right	F	116.7	0.93	30
<b>New Sudbury Street/Cross Street</b>	<b>B</b>	<b>11.1</b>		
New Sudbury EB left   left	A	8.5	0.17	36
Cross NB left/thru   thru	B	12.2	0.74	235
<b>New Chardon Street/SASB</b>	<b>C</b>	<b>24.2</b>		
New Chardon EB bear right   bear right	D	44.4	0.61	186
New Chardon EB right	C	32.9	0.27	56
SASB SB left	B	14.0	0.72	74
SASB SB left/thru   thru/right	B	10.5	0.71	70
SASB SB right	B	15.3	0.74	79
I-93 NWB left   left	D	41.6	0.75	#240

Table 5. (cont.) Existing (2008) Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>North Washington Street/Cross Street</b>	<b>C</b>	<b>22.5</b>		
Cooper Street WB right	A	0.9	0.15	0
I-93 NB thru   thru	D	45.6	0.52	82
Cross NWB bear right   bear right	B	17.8	0.44	227
<b>North Washington Street/Beverly Street</b>	<b>B</b>	<b>17.5</b>		
N. Washington SB thru   thru   thru	C	20.7	0.68	290
Beverly SEB right   right   right	A	1.6	0.14	m4
<b>Valenti Way/Beverly Street</b>	<b>A</b>			
Valenti WB left	A	0.5	0.19	17
<b>Valenti Way/North Washington Street</b>	<b>C</b>	<b>21.5</b>		
N. Washington NB left (de facto)	F	90.0	1.00	#309
N. Washington NB thru/right	B	18.8	0.70	369
N. Washington SB left/thru   thru   thru/right	A	9.0	0.58	191
<b>Congress Street/Atlantic Avenue</b>	<b>C</b>	<b>29.4</b>		
Congress EB left   left	D	35.7	0.67	m142
Congress EB thru   thru	A	7.2	0.41	101
Congress WB right   right	A	0.5	0.24	0
Atlantic NB thru   thru   thru/right	D	43.6	1.01	m#305
<b>Summer Street/Atlantic Avenue</b>	<b>E</b>	<b>73.1</b>		
Summer EB left/thru   thru	D	37.8	0.61	m188
Summer WB thru   thru   thru/right	D	39.9	0.59	139
Atlantic NB left/thru   thru   thru	F	83.6	0.98	#428
Atlantic NB right	F	107.8	1.05	#455
<b>Essex Street/Atlantic Avenue</b>	<b>B</b>	<b>12.4</b>		
Essex EB left   left	D	35.6	0.69	126
Atlantic NB left/thru   thru   thru	A	8.4	0.62	368
<b>Beach Street/Atlantic Avenue</b>	<b>A</b>	<b>9.4</b>		
Atlantic NB left/thru   thru   thru	A	9.4	0.53	m313
<b>Kneeland Street/Atlantic Avenue/I-90 WB Off-Ramps</b>	<b>E</b>	<b>73.2</b>		
Kneeland EB left	E	61.3	0.89	m#254
Kneeland EB left/thru	D	48.6	0.81	m#230
MBTA Drive WB thru/right	D	39.0	0.05	18
Frontage NB left	D	40.3	0.51	#262
Frontage NB left/thru	D	44.9	0.64	#385
I-90 WB Off-Ramp NWB left	F	116.6	1.13	#568
I-90 WB Off-Ramp NWB thru	E	75.0	1.04	#1038
<b>North Street/Clinton Street</b>	<b>C</b>	<b>33.4</b>		
North EB thru	B	12.9	0.16	41
North WB thru   thru	C	30.7	0.48	234
Clinton NB left   left/right	D	46.9	0.72	135
<b>Purchase Street/Fire Station</b>	<b>A</b>			
Fire Station EB right	A	9.3	0.04	3
Purchase SB thru   thru   thru/right	A	0.0	0.29	0



Table 5. (cont.) Existing (2008) Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/Congress Street</b>	<b>D</b>	<b>51.5</b>		
State WB left/thru   thru/right	F	97.9	1.10	#317
Congress NB thru   thru	B	10.0	0.19	37
Congress SB thru   thru/bear right	C	27.9	0.74	282
Congress SB right	C	32.4	0.73	307
<b>North Street/Congress Street</b>	<b>D</b>	<b>42.3</b>		
North WB left   left/right	C	27.0	0.97	#475
Congress NB thru   thru   thru/right	A	3.6	0.38	4
Congress SB left/thru   thru   thru	F	93.2	1.07	#249
<b>North Street/Union Street</b>	<b>B</b>	<b>17.2</b>		
North EB left/thru   thru	A	1.1	0.06	m1
North WB thru   thru/right	B	18.7	0.71	398
<b>Hanover Street/Congress Street</b>	<b>B</b>	<b>11.0</b>		
Hanover WB left	C	21.1	0.56	119
Congress NB thru   thru   thru/right	B	12.1	0.27	m82
Congress SB thru   thru   thru	A	4.6	0.25	33
<b>New Sudbury Street/Congress Street/Merrimac Street</b>	<b>C</b>	<b>35.0</b>		
New Sudbury EB left	D	52.2	0.68	165
New Sudbury EB thru   thru	D	38.5	0.42	106
New Sudbury EB right	A	9.9	0.43	54
Congress NB thru   thru   thru/right	D	40.5	0.88	#321
Merrimac SB left	D	38.8	0.53	m58
Merrimac SB thru   thru   thru	C	20.2	0.23	m70
<b>New Chardon Street/Merrimac Street</b>	<b>E</b>	<b>79.1</b>		
New Chardon EB left/thru   thru/right	A	6.9	0.38	8
New Chardon WB hard left/left	F	297.5	1.53	#365
New Chardon WB thru   thru/right	B	16.2	0.37	126
Merrimac NB hard left/left	F	120.4	1.19	m#480
Merrimac NB thru   thru/right	C	22.1	0.74	m102
Merrimac SB left/thru   thru   thru/right	D	45.7	0.76	102
<b>Summer Street/Dorchester Avenue</b>	<b>E</b>	<b>66.4</b>		
Summer EB left/thru   thru/right	E	65.9	1.02	m#434
Summer WB left/thru   thru/right	B	12.9	0.69	182
Dorchester NB left/thru/right	C	29.7	0.39	45
Dorchester SB left	F	228.6	1.38	#434
Dorchester SB thru/right	B	14.8	0.26	42
<b>Summer Street/Melcher Street</b>	<b>C</b>	<b>23.5</b>		
Summer EB thru   thru/right	B	18.5	0.64	m238
Summer WB left/thru   thru	C	25.7	0.64	239
Melcher NB left/right	D	50.7	0.65	152
<b>Summer Street/Pump House Road</b>	<b>B</b>	<b>10.4</b>		
Summer EB left/thru   thru	A	7.8	0.31	164
Summer WB thru   thru   thru/right	A	9.3	0.38	194
Driveway NB left/thru/right	—	—	—	—
Pump House SB left	D	43.2	0.28	67
Pump House SB left/right	C	30.2	0.28	61

Table 5. (cont.) Existing (2008) Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Massport Haul Road/Pump Station Connector</b>	<b>C</b>	<b>34.4</b>		
Haul EB thru	B	11.5	0.10	63
Haul EB right	A	3.7	0.12	23
Haul WB left	A	7.1	0.02	13
Haul WB thru	A	6.8	0.08	25
Pump Station NB left   left/right	E	56.3	0.73	141
<b>Summer Street/D Street</b>	<b>C</b>	<b>31.3</b>		
Summer EB left	C	26.1	0.29	110
Summer EB thru   thru/right	C	21.5	0.28	165
Summer WB left/thru   thru	D	46.8	0.61	#189
Summer WB right	B	12.7	0.42	128
D Street NB left	D	48.4	0.51	87
D Street NB thru   thru/right	D	37.5	0.47	83
D Street SB left	D	48.7	0.63	93
D Street SB thru   thru/right	C	32.0	0.52	73
<b>Ramp DB (I-90 WB On Ramp)/D Street</b>	<b>B</b>	<b>13.5</b>		
D Street NB left	E	55.5	0.70	#207
D Street NB thru   thru	A	1.5	0.18	68
D Street SB thru   thru/right	A	9.3	0.27	88
<b>Transitway/D Street</b>	<b>A</b>	<b>7.0</b>		
Transitway EB thru	D	48.5	0.36	43
Transitway WB thru	D	47.0	0.32	47
D Street NB thru   thru   thru/right	A	6.1	0.18	44
D Street SB thru   thru	A	2.4	0.23	62
<b>Congress Street/D Street</b>	<b>C</b>	<b>35.0</b>		
Congress EB left/thru   thru/right	C	23.2	0.36	m109
Congress EB right	A	7.1	0.52	M67
Congress WB left/thru   thru/right	C	34.6	0.42	35
D Street NB left	E	77.3	0.91	#253
D Street NB left/thru   thru/right	D	47.3	0.81	106
D Street SB left/thru   thru/right	D	41.6	0.55	93
<b>Congress Street/B Street/Ramps D&amp;F</b>	<b>E</b>	<b>64.4</b>		
Congress EB left/thru   thru	D	50.4	0.91	m#206
Congress EB right	A	9.8	0.12	m1
Congress WB left	A	9.8	0.34	m27
Congress WB left/thru   thru/right	A	7.0	0.34	m19
Ramp NB left	F	302.2	1.55	#425
Ramp NB thru	C	34.6	0.63	209
Ramp NB right	A	6.2	0.60	63
B Street SB thru   thru	D	53.7	0.13	23
B Street SB right	D	35.2	0.10	m14

Table 5. (cont.) Existing (2008) Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/East Service Road/Ramps I&amp;C</b>	<b>E</b>	<b>57.8</b>		
Congress EB left	B	17.6	0.12	28
Congress EB thru   thru	B	17.6	0.11	m46
Congress WB thru   thru	A	8.1	0.21	m23
Congress WB right	A	1.5	0.10	m1
Ramp I NB left/thru   thru	E	58.3	0.86	#204
Ramp I NB right	B	10.8	0.60	48
Ramp C NEB thru   thru/right	F	103.6	1.11	#414
<b>Congress Street/Boston Wharf Road</b>	<b>C</b>	<b>28.9</b>		
Congress EB left/thru	D	38.1	0.71	m#160
Congress EB right	A	6.8	0.09	m10
Congress WB left	B	15.5	0.08	m14
Congress WB thru   thru/right	B	14.7	0.31	m123
Boston Wharf NB left	D	46.5	0.60	163
Boston Wharf NB thru/right	C	30.5	0.23	51
Boston Wharf SB left/thru	E	70.1	0.46	66
Boston Wharf SB right	C	32.3	0.35	m61
<b>Seaport Boulevard (Northern Avenue)/ B Street</b>	<b>C</b>	<b>26.6</b>		
Seaport EB thru   thru/right	C	28.3	0.68	367
Seaport WB left/thru   thru	B	19.4	0.50	179
B Street NB left   left	D	41.7	0.60	m81
B Street NB right	A	9.4	0.45	m8
<b>Seaport Boulevard/Northern Avenue/East Service Road</b>	<b>C</b>	<b>25.1</b>		
Seaport EB left	B	14.6	0.19	25
Seaport EB thru   thru	B	14.2	0.45	162
Seaport WB thru   thru/right	C	23.5	0.62	205
East Service NB left	D	49.7	0.54	m95
East Service NB thru	D	53.7	0.70	m131
East Service NB right	B	16.3	0.58	m72
Northern SB left	D	45.3	0.26	38
Northern SB left/right	C	30.0	0.24	41
<b>Seaport Boulevard/Sleeper Street</b>	<b>C</b>	<b>23.9</b>		
Seaport EB left/thru   thru	D	37.1	3.56dl	#505
Seaport EB right	A	2.1	0.16	20
Seaport WB left	A	1.8	0.09	m3
Seaport WB thru   thru/right	A	2.0	0.27	82
Sleeper NB left/thru/right	D	48.0	0.71	77
Sleeper SB left/thru	D	38.3	0.23	27
Sleeper SB right	B	13.2	0.19	22
<b>Congress Street/Dorchester Avenue</b>	<b>C</b>	<b>21.9</b>		
Congress EB thru   thru/right	A	8.6	0.47	117
Congress WB left/thru	C	20.8	0.46	150
Dorchester NB left/right	D	52.0	0.85	228

Table 5. (cont.) Existing (2008) Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/A Street</b>	<b>D</b>	<b>39.1</b>		
Congress EB left/thru   thru	C	22.1	0.28	95
Congress EB right	A	5.9	0.18	29
Congress WB left	C	29.8	0.65	#412
Congress WB thru/right	B	18.9	0.24	198
A Street NB left/thru/right	F	96.5	1.03	112
Thompson SB left/thru/right	C	29.0	0.14	5
<b>Summer Street/West Side Drive</b>	<b>A</b>	<b>6.2</b>		
Summer EB thru   thru/right	A	4.4	0.37	132
Summer WB left	A	9.8	0.11	16
Summer WB thru   thru	A	7.5	0.24	91
West Side NB left	D	39.2	0.02	13
West Side NB right	C	22.5	0.05	6
<b>Summer Street/WTC Avenue</b>	<b>A</b>	<b>8.6</b>		
Summer EB left	A	2.2	0.06	2
Summer EB thru   thru	A	3.4	0.31	14
Summer EB right	A	0.4	0.08	0
Summer WB left	A	8.6	0.19	m23
Summer WB thru   thru/right	B	10.6	0.30	65
WTC NB left	D	42.2	0.17	39
WTC NB thru/right	B	17.1	0.18	9
WTC SB left	D	43.7	0.20	36
WTC SB thru/right	A	0.0	0.02	0
<b>Seaport Boulevard/Boston Wharf Road</b>	<b>B</b>	<b>16.1</b>		
Seaport EB thru   thru/right	C	23.8	0.61	m#390
Seaport WB left	A	5.9	0.14	m20
Seaport WB thru  thru	A	4.5	0.26	110
Boston Wharf NB left   left/right	C	27.1	0.26	m17
<b>SSCONN/Albany Street</b>	<b>A</b>	<b>8.7</b>		
SSCONN WB left   left	D	42.4	0.33	42
Albany SB left/thru   thru   thru	A	4.4	0.20	92
<b>Broadway Bridge/Frontage Road</b>	<b>F</b>	<b>121.3</b>		
Traveler EB hard left	D	37.9	0.17	m40
Traveler EB left	F	257.6	0.68	m145
Traveler EB thru   thru	B	19.2	0.40	165
Broadway WB right	E	65.2	0.93	#389
Broadway WB hard right (de facto)	F	350.0	1.70	#854
Frontage NB thru   thru	B	14.2	0.18	m30
Frontage NB right   right   right/hard right	C	20.8	0.64	64
<b>Bennington Street/Neptune Road</b>	<b>F</b>	<b>111.5</b>		
Bennington EB left/thru   thru/right	D	53.4	0.55	103
Bennington WB left/thru   thru/right	C	21.6	0.72	m43
Neptune NB left/thru   thru/right	C	27.7	0.62	#218
Neptune SB left (de facto)	F	291.8	1.58	#1112
Neptune SB thru/right	B	19.0	0.56	#544

Table 5. (cont.) Existing (2008) Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>SSECONN/Ramps K&amp;X</b>	<b>B</b>	<b>10.3</b>		
SSECONN EB left/thru	D	46.9	0.29	40
SSECONN EB right	B	14.5	0.09	6
SSECONN WB left	D	47.9	0.25	32
SSECONN WB thru/right	C	28.4	0.36	35
Ramp NB left/thru   thru/right	A	7.8	0.45	280
Ramp SB left	A	8.5	0.06	7
Ramp SB left/thru   thru/right	A	3.7	0.04	6
<b>East Berkeley Street/Albany Street</b>	<b>D</b>	<b>52.5</b>		
East Berkeley WB left/thru   thru   thru	E	65.8	0.66	m93
Albany SB thru   thru   thru/right	C	27.4	0.48	109
<b>West 4<sup>th</sup> Street/Frontage Road</b>	<b>E</b>	<b>64.2</b>		
West 4 <sup>th</sup> WB thru   thru   thru/right	F	132.9	1.03	#366
Frontage NB left	B	16.9	0.62	m#567
Frontage NB thru   thru/right	B	14.2	0.61	#466
<b>Traveler Street/Albany Street</b>	<b>B</b>	<b>13.6</b>		
Traveler EB thru/right	E	62.6	0.72	169
Albany SB left	A	9.6	0.51	306
Albany SB left/thru   thru/right	A	7.5	0.52	290
<b>Herald Street/Albany Street</b>	<b>C</b>	<b>22.7</b>		
Herald EB right   right   right	B	13.6	0.53	184
Albany SB thru   thru   thru	C	29.2	0.83	224
<b>MBTA Bus Lot (near Randolph)/Albany Street</b>	<b>C</b>	<b>20.7</b>		
MBTA EB thru/right	C	31.0	0.05	11
Albany SB left	C	23.9	0.18	m83
Albany SB left/bear left   bear left	C	23.4	0.18	71
Albany SB thru/right	B	10.4	0.56	84
Albany NB right   right	C	29.7	0.76	44
<b>Ramp A2/Ramp I/Frontage Road</b>	<b>E</b>	<b>72.7</b>		
Frontage SB thru	B	15.3	0.40	94
Frontage SB right	B	12.6	0.10	29
Ramp SWB left/thru   thru	F	84.3	1.11	#754
<b>Nashua Street/Martha Road</b>	<b>B</b>	<b>12.2</b>		
Nashua WB left   left	C	23.5	0.66	110
Martha SB thru   thru	A	5.1	0.34	111
<b>Chelsea Street/Rutherford Avenue/North Washington St.</b>	<b>D</b>	<b>46.4</b>		
Chelsea WB left	F	206.2	1.36	#723
Chelsea WB thru	D	43.4	0.77	#366
Chelsea WB right	A	5.8	0.34	36
N. Washington NB thru   thru   thru	C	23.7	0.25	79
N. Washington NB right	A	6.8	0.67	86
Rutherford SB left	F	114.8	1.11	m#387
Rutherford SB thru   thru   thru	A	3.3	0.51	m60
Rutherford SB right	A	4.0	0.62	m39

Table 5. (cont.) Existing (2008) Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>LT-TL/Rutherford Avenue</b>	<b>C</b>	<b>28.2</b>		
Ramp EB left   left	C	33.4	0.56	163
Ramp EB right   right	D	43.7	0.81	224
Rutherford NB left	E	64.4	0.91	m#244
Rutherford NB thru   thru   thru   thru	A	6.4	0.11	m33
Rutherford SB thru   thru   thru   thru	C	26.1	0.72	343
Rutherford SB right	A	4.4	0.25	72
<b>Albany Street/Frontage Road</b>	<b>B</b>	<b>18.7</b>		
Albany EB left   left	C	22.7	0.78	132
Albany EB thru	A	9.3	0.07	m6
Albany WB right	B	16.9	0.43	36
Frontage NB thru   thru   thru/right	B	17.3	0.55	290
<b>Neptune Road/Route 1A Off-ramp</b>	<b>D</b>	<b>40.7</b>		
Neptune EB left/thru   thru	A	3.6	0.06	m5
Neptune WB thru   thru/right	B	15.5	0.30	48
Off-Ramp NB left	E	76.0	0.89	#345
Off-Ramp NB thru/right	D	38.9	0.38	122

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

m = 95th percentile queue is metered by upstream traffic signal.

\* 25-foot left-turn pocket added during calibration process.

Table 6. Existing (2008) Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Pearl Street/Atlantic Avenue</b>	<b>A</b>	<b>2.0</b>		
Atlantic WB left/thru   thru   thru	A	2.0	0.32	79
<b>Pearl Street/Purchase Street</b>	<b>C</b>	<b>29.8</b>		
Pearl WB left	D	44.1	0.30	56
Pearl WB left/thru   thru	D	43.0	0.40	54
Purchase SB thru   thru   thru/right	C	28.0	0.49	m264
<b>Seaport Boulevard/Atlantic Avenue</b>	<b>C</b>	<b>33.8</b>		
Seaport EB left/thru   thru	B	18.6	0.53	150
Seaport WB thru/bear right	E	59.8	0.81	#214
Seaport WB bear right/right	E	56.6	0.77	146
Seaport WB right	A	9.8	0.55	24
Atlantic NB left/bear left	D	41.7	0.75	#417
Atlantic NB left/thru   thru/right	C	34.1	0.75	#357
<b>Oliver Street/Purchase Street</b>	<b>D</b>	<b>37.6</b>		
Oliver WB left/thru   thru	D	40.2	0.77	m105
Purchase SB thru   thru   thru/right	D	49.9	0.85	229
I-93 SWB left	B	11.5	0.44	191
I-93 SWB thru   right	C	32.0	0.49	187
<b>High Street/Atlantic Avenue</b>	<b>B</b>	<b>16.1</b>		
High EB left   left	D	38.4	0.34	64
Atlantic NB thru   thru	A	9.9	0.38	184
<b>High Street/Purchase Street</b>	<b>B</b>	<b>10.7</b>		
High EB thru   thru/right	B	15.9	0.37	35
Purchase SB left/thru   thru   thru	A	9.2	0.39	30
<b>Broad Street/Purchase Street</b>	<b>A</b>	<b>3.2</b>		
Broad EB right	A	1.5	0.31	0
Purchase SB thru   thru   thru/right	A	3.5	0.27	31
<b>East India Row/Atlantic Avenue</b>	<b>A</b>	<b>2.8</b>		
East India WB thru/right	C	22.8	0.29	39
Atlantic NB left/thru   thru/right	A	1.4	0.30	63
<b>India Street/SASB</b>	<b>B</b>	<b>14.0</b>		
India WB left   left	D	48.7	0.28	53
India WB thru	D	50.1	0.25	66
SASB SB thru   thru   thru/right	A	6.3	0.22	70
<b>Milk Street/Atlantic Avenue</b>	<b>B</b>	<b>14.6</b>		
Milk EB left   left	D	43.0	0.38	54
Milk EB thru	D	50.1	0.50	86
Milk WB right	A	0.1	0.04	0
Atlantic NB thru   thru/right	A	4.6	0.42	19
<b>Milk Street/SASB</b>	<b>A</b>	<b>9.0</b>		
Milk EB thru   thru/right	B	17.3	0.29	43
SASB SB left/thru   thru   thru	A	6.7	0.36	47
<b>State Street/Atlantic Avenue</b>	<b>A</b>	<b>5.1</b>		
State WB thru/right	B	19.2	0.18	44
Atlantic NB left/thru   thru   thru/right	A	3.8	0.24	41

Table 6. (cont.) Existing (2008) Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/SASB</b>	<b>D</b>	<b>37.1</b>		
State WB left	C	33.6	0.24	60
State WB thru   thru	C	32.7	0.31	76
SASB SB thru   thru   thru/right	D	38.2	0.44	182
<b>Mercantile Street/Atlantic Avenue/Cross Street</b>	<b>B</b>	<b>19.2</b>		
Mercantile EB left/thru   thru	D	47.6	0.36	85
Atlantic WB thru   thru/right	C	32.4	0.45	93
Atlantic NB left/thru   thru	A	8.1	0.22	38
Atlantic NB right	A	2.9	0.34	0
<b>Mercantile Street/SASB</b>	<b>B</b>	<b>13.2</b>		
Mercantile WB left   left	B	11.5	0.37	18
SASB SB left/thru   thru   thru	B	13.6	0.31	135
<b>Commercial Street/Cross Street</b>	<b>A</b>	<b>1.9</b>		
Commercial WB right	A	0.2	0.07	0
Cross NB thru   thru	A	2.1	0.17	20
<b>Clinton Street/SASB</b>	<b>C</b>	<b>22.8</b>		
I-93 WB left	D	43.1	0.69	171
I-93 WB left/thru	D	42.7	0.70	207
SASB SB thru   thru   thru/right	A	8.1	0.37	62
<b>Kneeland Street/SASB</b>	<b>C</b>	<b>24.5</b>		
Kneeland EB thru   thru	E	75.8	0.86	#205
Kneeland EB right	A	8.7	0.48	53
Kneeland WB left	B	16.0	0.42	m24
Kneeland WB thru   thru	B	17.8	0.54	101
SASB SB left/thru   thru   thru/right	A	6.8	0.50	60
<b>Beach Street/SASB</b>	<b>A</b>	<b>6.3</b>		
Beach WB left	D	41.8	0.56	104
SASB SB thru   thru   thru	A	1.2	0.31	15
<b>Essex Street/Lincoln Street/SASB</b>	<b>C</b>	<b>26.7</b>		
Essex EB left/thru   thru	D	39.1	0.75	170
Essex EB right/hard right	C	32.9	0.71	161
SASB SB left/thru   thru   thru/right	B	14.4	0.52	175
I-93 Ramp NWB left/thru   thru   thru/right	C	31.1	0.51	112
<b>Essex Street/South Street</b>	<b>A</b>	<b>8.6</b>		
Essex EB thru   thru/right	A	5.6	0.28	30
South WB left   left	C	33.3	0.13	25
<b>Summer Street/Purchase Street/SASB</b>	<b>D</b>	<b>41.6</b>		
Summer EB thru	D	37.9	0.28	73
Summer EB right	B	12.2	0.24	5
Summer WB left	D	39.8	0.72	m#117
Summer WB left/thru   thru	C	32.1	0.73	m#113
Purchase SB left/thru   thru/right	E	57.0	0.96	m#265
I-90 off-ramp SWB left/thru   thru/right	C	27.7	0.34	105



Table 6. (cont.) Existing (2008) Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/Purchase Street</b>	<b>D</b>	<b>38.2</b>		
Congress EB thru   thru   thru/right	B	19.7	0.37	118
Congress EB right	C	21.9	0.37	138
Purchase SB hard left	C	30.0	0.63	246
Purchase SB left/thru   thru	E	59.4	0.88	#316
<b>Kneeland Street/Lincoln Street</b>	<b>E</b>	<b>61.3</b>		
Kneeland EB left (de facto)	E	73.3	0.93	m#212
Kneeland EB thru/right	F	183.7	0.64	m268
Kneeland WB left/thru   thru   thru/right	C	30.7	0.75	90
Lincoln NB left/thru   thru	B	17.5	0.32	175
Lincoln NB right	A	4.7	0.24	41
<b>North Street/SASB</b>	<b>B</b>	<b>12.4</b>		
North Street EB right	A	3.6	0.19	51
I-93 WB left/thru   thru	A	5.1	0.29	97
SASB SB thru   thru/right	C	30.0	0.66	146
<b>North Street/Cross Street</b>	<b>C</b>	<b>22.0</b>		
I-93 EB left	B	15.8	0.27	123
I-93 EB left/thru	B	15.9	0.28	91
Cross NB thru   thru/right	C	27.1	0.73	168
<b>Hanover Street/SASB</b>	<b>A</b>	<b>9.9</b>		
Hanover EB thru   thru/right	B	15.1	0.08	10
Hanover WB left	C	21.9	0.17	m42
Hanover WB thru	C	23.0	0.20	67
SASB SB left/thru   thru/right	A	3.7	0.28	28
<b>Hanover Street/Cross Street</b>	<b>A</b>	<b>9.6</b>		
Hanover EB left	C	34.9	0.17	27
Hanover EB thru	D	35.6	0.25	37
Hanover WB thru/right	C	30.3	0.64	112
Cross NB left/thru   thru/right	A	2.0	0.36	25
<b>New Sudbury Street/SASB</b>	<b>C</b>	<b>25.6</b>		
New Sudbury EB thru   thru	A	8.7	0.14	63
New Sudbury EB right	A	2.6	0.29	28
SASB SB left (de facto)	E	55.4	0.85	40
SASB SB thru	D	35.8	0.69	166
Haymarket Station SEB right	E	58.9	0.50	14
<b>New Sudbury Street/Cross Street</b>	<b>B</b>	<b>16.3</b>		
New Sudbury EB left   left	B	11.9	0.16	m59
Cross NB left/thru   thru	B	19.1	0.72	161
<b>New Chardon Street/SASB</b>	<b>C</b>	<b>22.6</b>		
New Chardon EB bear right   bear right	C	30.9	0.52	183
New Chardon EB right	C	22.0	0.17	62
SASB SB left	B	19.9	0.60	67
SASB SB left/thru   thru/right	B	17.1	0.60	59
SASB SB right	C	20.8	0.61	65
I-93 NWB left   left	C	21.3	0.29	92

Table 6. (cont.) Existing (2008) Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>North Washington Street/Cross Street</b>	<b>B</b>	<b>10.3</b>		
Cooper Street WB right	A	0.9	0.18	0
I-93 NB thru   thru	D	39.2	0.37	51
Cross NWB bear right   bear right	A	5.1	0.41	60
<b>North Washington Street/Beverly Street</b>	<b>B</b>	<b>15.8</b>		
N. Washington SB thru   thru   thru	B	18.0	0.47	125
Beverly SEB right   right   right	A	9.8	0.13	m45
<b>Valenti Way/Beverly Street</b>	<b>A</b>			
Valenti WB left   left/thru   thru	A	0.5	0.18	16
<b>Valenti Way/North Washington Street</b>	<b>A</b>	<b>8.4</b>		
N. Washington NB left/thru   thru/right	A	2.4	0.53	13
N. Washington SB left/thru   thru   thru/right	B	14.0	0.72	221
<b>Congress Street/Atlantic Avenue</b>	<b>D</b>	<b>35.6</b>		
Congress EB left   left	C	34.6	0.64	136
Congress EB thru   thru	A	8.1	0.30	66
Congress WB right   right	A	0.5	0.23	0
Atlantic NB thru   thru   thru/right	E	62.2	0.80	175
<b>Summer Street/Atlantic Avenue</b>	<b>C</b>	<b>34.6</b>		
Summer EB left/thru   thru	D	37.3	0.35	m110
Summer WB thru   thru   thru/right	C	29.8	0.47	117
Atlantic NB left/thru   thru   thru	C	34.3	0.75	208
Atlantic NB right	D	42.0	0.70	#217
<b>Essex Street/Atlantic Avenue</b>	<b>B</b>	<b>11.2</b>		
Essex EB left   left	C	26.6	0.58	56
Atlantic NB left/thru   thru   thru	A	7.2	0.34	102
<b>Beach Street/Atlantic Avenue</b>	<b>A</b>	<b>3.8</b>		
Atlantic NB left/thru   thru   thru	A	3.8	0.28	m57
<b>Kneeland Street/Atlantic Avenue/I-90 WB Off-Ramps</b>	<b>D</b>	<b>46.2</b>		
Kneeland EB left	F	89.7	0.94	#278
Kneeland EB left/thru	E	79.4	0.90	#272
MBTA Drive WB thru/right	C	33.0	0.02	6
Frontage NB left	C	26.4	0.34	162
Frontage NB left/thru	C	26.9	0.37	176
I-90 WB Off-Ramp NWB left	E	56.2	0.82	165
I-90 WB Off-Ramp NWB thru	B	12.0	0.37	174
<b>North Street/Clinton Street</b>	<b>C</b>	<b>29.4</b>		
North EB thru	B	12.9	0.21	75
North WB thru   thru	C	21.1	0.36	188
Clinton NB left   left/right	D	53.9	0.66	135
<b>Purchase Street/Fire Station</b>	<b>A</b>			
Fire Station EB right	A	9.4	0.06	5
Purchase SB thru   thru   thru/right	A	0.0	0.23	0

Table 6. (cont.) Existing (2008) Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/Congress Street</b>	<b>C</b>	<b>21.1</b>		
State WB left/thru   thru/right	C	24.4	0.57	164
Congress NB thru   thru	B	15.1	0.26	51
Congress SB thru   thru/bear right	B	19.8	0.61	214
Congress SB right	C	23.0	0.59	229
<b>North Street/Congress Street</b>	<b>B</b>	<b>18.6</b>		
North WB left   left/right	C	22.4	0.86	#30
Congress NB thru   thru   thru/right	A	2.0	0.33	4
Congress SB left/thru   thru   thru	C	27.9	0.60	136
<b>North Street/Union Street</b>	<b>D</b>	<b>50.8</b>		
North EB left/thru   thru	A	1.1	0.10	1
North WB thru   thru/right	E	63.0	0.54	284
<b>Hanover Street/Congress Street</b>	<b>B</b>	<b>10.6</b>		
Hanover WB left	A	8.6	0.30	61
Congress NB thru   thru   thru/right	B	16.2	0.23	m89
Congress SB thru   thru   thru	A	4.6	0.19	36
<b>New Sudbury Street/Congress Street/Merrimac Street</b>	<b>C</b>	<b>31.2</b>		
New Sudbury EB left	D	42.8	0.62	156
New Sudbury EB thru   thru	C	32.6	0.37	93
New Sudbury EB right	A	8.6	0.48	51
Congress NB thru   thru   thru/right	D	38.9	0.77	#216
Merrimac SB left	C	26.8	0.41	m41
Merrimac SB thru   thru   thru	B	18.5	0.17	m48
<b>New Chardon Street/Merrimac Street</b>	<b>D</b>	<b>37.5</b>		
New Chardon EB left/thru   thru/right	A	8.3	0.54	11
New Chardon WB hard left/left	E	61.6	0.75	104
New Chardon WB thru   thru/right	A	6.6	0.21	45
Merrimac NB hard left/left	F	88.9	1.06	m#356
Merrimac NB thru   thru/right	C	32.6	0.62	m128
Merrimac SB left/thru   thru   thru/right	C	32.1	0.58	94
<b>Summer Street/Dorchester Avenue</b>	<b>C</b>	<b>27.6</b>		
Summer EB left/thru   thru/right	C	22.9	0.72	#470
Summer WB left/thru   thru/right	C	20.5	0.54	#261
Dorchester NB left/thru/right	C	24.4	0.44	72
Dorchester SB left	E	65.6	0.87	197
Dorchester SB thru/right	B	19.3	0.29	44
<b>Summer Street/Melcher Street</b>	<b>B</b>	<b>13.3</b>		
Summer EB thru   thru/right	A	5.6	0.49	m102
Summer WB left/thru   thru	B	18.0	0.52	180
Melcher NB left/right	D	40.6	0.66	133
<b>Summer Street/Pump House Road</b>	<b>B</b>	<b>10.5</b>		
Summer EB left/thru   thru	A	6.7	0.27	123
Summer WB thru   thru   thru/right	A	9.2	0.23	98
Driveway NB left/thru/right	—	—	—	—
Pump House SB left	D	42.3	0.34	45
Pump House SB left/right	C	26.0	0.34	43

Table 6. (cont.) Existing (2008) Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Massport Haul Road/Pump Station Connector</b>	<b>B</b>	<b>11.6</b>		
Haul EB thru	B	14.0	0.08	51
Haul EB right	A	5.4	0.11	29
Haul WB left	A	7.9	0.06	14
Haul WB thru	A	7.9	0.07	39
Pump Station NB left   left/right	B	17.1	0.23	46
<b>Summer Street/D Street</b>	<b>C</b>	<b>27.3</b>		
Summer EB left	B	13.2	0.27	69
Summer EB thru   thru/right	A	9.6	0.22	74
Summer WB left/thru   thru	C	29.9	0.44	104
Summer WB right	C	22.6	0.29	158
D Street NB left	D	39.2	0.36	74
D Street NB thru   thru/right	C	21.9	0.37	56
D Street SB left	D	46.1	0.50	129
D Street SB left/thru   thru/right	C	28.4	0.49	64
<b>Ramp DB (I-90 WB On Ramp)/D Street</b>	<b>A</b>	<b>7.8</b>		
D Street NB left	C	31.1	0.49	131
D Street NB thru   thru	A	1.3	0.12	27
D Street SB thru   thru/right	A	4.4	0.25	110
<b>Transitway/D Street</b>	<b>A</b>	<b>4.4</b>		
Transitway EB thru	D	39.9	0.19	25
Transitway WB thru	D	38.6	0.19	29
D Street NB thru   thru   thru/right	A	3.0	0.11	0
D Street SB thru   thru	A	2.4	0.18	68
<b>Congress Street/D Street</b>	<b>C</b>	<b>25.1</b>		
Congress EB left/thru   thru/right	B	16.8	0.27	66
Congress EB right	A	5.3	0.33	52
Congress WB left/thru   thru/right	D	35.1	0.48	42
D Street NB left	D	38.5	0.60	70
D Street NB left/thru   thru/right	C	27.4	0.54	53
D Street SB left/thru   thru/right	D	36.4	0.51	84
<b>Congress Street/B Street/Ramps D&amp;F</b>	<b>C</b>	<b>25.5</b>		
Congress EB left/thru   thru	D	45.0	0.60	121
Congress EB right	B	10.8	0.31	4
Congress WB left	B	17.1	0.21	94
Congress WB left/thru   thru/right	B	14.7	0.20	56
Ramp NB left	D	52.6	0.51	101
Ramp NB thru	C	30.8	0.18	66
Ramp NB right	A	8.1	0.49	61
B Street SB thru   thru	D	43.7	0.23	32
B Street SB right	B	18.0	0.21	15

Table 6. (cont.) Existing (2008) Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/East Service Road/Ramps I&amp;C</b>	<b>B</b>	<b>18.9</b>		
Congress EB left	A	9.1	0.04	10
Congress EB thru   thru	A	8.0	0.09	32
Congress WB thru   thru	A	8.0	0.09	31
Congress WB right	A	3.6	0.02	6
Ramp I NB left/thru   thru	D	38.7	0.30	49
Ramp I NB right	B	13.1	0.46	24
Ramp C NEB thru   thru/right	D	36.0	0.32	59
<b>Congress Street/Boston Wharf Road</b>	<b>B</b>	<b>20.2</b>		
Congress EB left/thru	C	20.7	0.25	m112
Congress EB right	B	10.0	0.13	m34
Congress WB left	B	16.6	0.08	28
Congress WB thru   thru/right	B	13.0	0.12	61
Boston Wharf NB left	C	31.9	0.14	46
Boston Wharf NB thru/right	C	22.0	0.15	21
Boston Wharf SB left/thru	D	42.0	0.48	74
Boston Wharf SB right	B	14.2	0.28	48
<b>Seaport Boulevard (Northern Avenue)/ B Street</b>	<b>B</b>	<b>17.7</b>		
Seaport EB thru  thru/right	B	12.1	0.67	131
Seaport WB left	D	36.1	0.59	63
Seaport WB thru	B	19.4	0.59	256
B Street NB left   left	D	39.4	0.47	80
B Street NB right	B	11.5	0.55	48
<b>Seaport Boulevard/Northern Avenue/East Service Road</b>	<b>C</b>	<b>24.7</b>		
Seaport EB left	C	23.8	0.52	58
Seaport EB thru   thru	B	15.2	0.55	128
Seaport WB thru   thru/right	C	23.7	0.77	206
East Service NB left	D	47.7	0.63	162
East Service NB thru	D	44.0	0.54	139
East Service NB right	C	21.4	0.68	85
Northern SB left	D	41.6	0.51	100
Northern SB left/right	B	17.1	0.47	82
<b>Seaport Boulevard/Sleeper Street</b>	<b>A</b>	<b>8.5</b>		
Seaport EB left/thru   thru	A	9.7	1.27dl	65
Seaport EB right	A	2.1	0.07	m8
Seaport WB left	A	2.2	0.08	6
Seaport WB thru   thru/right	A	2.0	0.22	21
Sleeper NB left/thru/right	C	33.9	0.45	17
Sleeper SB left/thru	D	39.5	0.24	32
Sleeper SB right	B	13.7	0.42	19
<b>Congress Street/Dorchester Avenue</b>	<b>B</b>	<b>17.1</b>		
Congress EB thru   thru/right	A	9.6	0.32	22
Congress WB left/thru	C	20.2	0.41	m189
Dorchester NB left/right	D	50.4	0.72	112

Table 6. (cont.) Existing (2008) Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/A Street</b>	<b>C</b>	<b>21.9</b>		
Congress EB left/thru   thru	B	15.4	0.26	54
Congress EB right	A	2.3	0.17	m4
Congress WB left	B	14.8	0.33	111
Congress WB thru/right	B	12.0	0.15	101
A Street NB left/thru/right	D	51.4	0.85	26
Thompson SB left/thru/right	C	24.8	0.12	23
<b>Summer Street/West Side Drive</b>	<b>B</b>	<b>12.2</b>		
Summer EB thru   thru/right	B	17.5	0.28	153
Summer WB left	A	4.8	0.05	4
Summer WB thru   thru	A	3.6	0.14	27
West Side NB left	C	30.6	0.09	17
West Side NB right	B	11.8	0.20	6
<b>Summer Street/WTC Avenue</b>	<b>C</b>	<b>22.0</b>		
Summer EB left	C	25.0	0.06	44
Summer EB thru   thru	C	29.3	0.27	157
Summer EB right	C	23.7	0.07	48
Summer WB left	B	11.3	0.10	30
Summer WB thru   thru/right	B	16.1	0.17	90
WTC NB left	C	31.8	0.16	20
WTC NB thru/right	A	0.1	0.05	0
WTC SB left	C	31.1	0.10	27
WTC SB thru/right	A	0.1	0.03	0
<b>Seaport Boulevard/Boston Wharf Road</b>	<b>B</b>	<b>18.7</b>		
Seaport EB thru   thru/right	C	24.6	0.49	#277
Seaport WB left	A	8.9	0.27	56
Seaport WB thru   thru	A	7.0	0.14	m102
Boston Wharf NB left   left/right	C	34.8	0.30	33
<b>SSCONN/Albany Street</b>	<b>A</b>	<b>7.5</b>		
SSCONN WB left   left	D	38.0	0.25	41
Albany SB left/thru   thru   thru	A	4.8	0.23	102
<b>Broadway Bridge/Frontage Road</b>	<b>E</b>	<b>72.1</b>		
Traveler EB hard left	D	40.6	0.17	m54
Traveler EB left	F	424.7	0.71	#185
Traveler EB thru   thru	B	13.7	0.26	62
Broadway WB right	C	24.0	0.31	86
Broadway WB hard right (de facto)	E	59.8	0.94	#334
Frontage NB thru   thru	B	18.3	0.16	47
Frontage NB right   right   right/hard right	C	24.6	0.61	128
<b>Bennington Street/Neptune Road</b>	<b>C</b>	<b>28.5</b>		
Bennington EB left/thru   thru/right	E	56.3	0.56	68
Bennington WB left/thru   thru/right	C	31.8	0.77	m73
Neptune NB left/thru   thru/right	C	32.3	0.59	#357
Neptune SB left/ thru   thru/right	B	16.7	0.51	253

Table 6. (cont.) Existing (2008) Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>SSECONN/Ramps K&amp;X</b>	<b>B</b>	<b>10.5</b>		
SSECONN EB left/thru	C	27.7	0.11	14
SSECONN EB right	C	29.3	0.11	16
SSECONN WB left	D	40.8	0.23	26
SSECONN WB thru/right	C	22.4	0.49	23
Ramp NB left/thru   thru/right	A	8.0	0.39	151
Ramp SB left	A	9.5	0.04	5
Ramp SB left/thru   thru/right	A	5.4	0.04	15
<b>East Berkeley Street/Albany Street</b>	<b>A</b>	<b>9.3</b>		
East Berkeley WB left/thru   thru   thru	A	7.4	0.39	38
Albany SB thru   thru   thru/right	B	11.6	0.32	77
<b>West 4<sup>th</sup> Street/Frontage Road</b>	<b>C</b>	<b>20.2</b>		
West 4 <sup>th</sup> WB thru   thru   thru/right	D	37.3	0.69	160
Frontage NB left	B	11.1	0.33	219
Frontage NB thru   thru/right	B	11.2	0.51	272
<b>Traveler Street/Albany Street</b>	<b>B</b>	<b>10.2</b>		
Traveler EB thru/right	D	40.0	0.65	105
Albany SB left	A	7.1	0.37	192
Albany SB left/thru   thru/right	A	5.8	0.37	159
<b>Herald Street/Albany Street</b>	<b>C</b>	<b>23.1</b>		
Herald EB right   right   right	A	8.4	0.43	114
Albany SB thru   thru   thru	D	35.5	0.78	257
<b>MBTA Bus Lot (near Randolph)/Albany Street</b>	<b>E</b>	<b>79.9</b>		
MBTA EB thru/right	C	23.3	0.05	4
Albany SB left	B	12.1	0.19	51
Albany SB left/bear left   bear left	B	11.6	0.19	58
Albany SB thru/right	A	6.3	0.41	79
Albany NB right   right	F	207.6	1.14	m#144
<b>Ramp A2/Ramp I/Frontage Road</b>	<b>C</b>	<b>26.6</b>		
Frontage SB thru	C	24.3	0.41	161
Frontage SB right	C	22.1	0.22	83
Ramp SWB left/thru   thru	C	27.5	0.89	364
<b>Nashua Street/Martha Road</b>	<b>A</b>	<b>2.6</b>		
Nashua WB left   left	A	0.7	0.29	0
Martha SB thru   thru	A	4.0	0.20	49
<b>Chelsea Street/Rutherford Avenue/North Washington Street</b>	<b>B</b>	<b>17.2</b>		
Chelsea WB left	E	57.4	0.83	#227
Chelsea WB thru	D	46.8	0.72	185
Chelsea WB right	A	8.0	0.39	47
N. Washington NB thru   thru   thru	B	14.9	0.19	72
N. Washington NB right	A	3.9	0.38	46
Rutherford SB left	D	52.6	0.64	m141
Rutherford SB thru   thru   thru	A	3.9	0.23	m55
Rutherford SB right	A	4.7	0.50	m132

Table 6. (cont.) Existing (2008) Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>LT-TL/Rutherford Avenue</b>	<b>D</b>	<b>37.2</b>		
Ramp EB left   left	C	30.7	0.34	70
Ramp EB right   right	A	5.2	0.29	19
Rutherford NB left	F	190.8	1.31	#432
Rutherford NB thru   thru   thru   thru	A	4.0	0.14	32
Rutherford SB thru   thru   thru   thru	C	24.3	0.75	296
Rutherford SB right	A	5.7	0.45	95
<b>Albany Street/Frontage Road</b>	<b>B</b>	<b>16.8</b>		
Albany EB left   left	B	17.9	0.79	m91
Albany EB thru	A	5.0	0.08	m2
Albany WB right	A	7.0	0.33	17
Frontage NB thru   thru   thru/right	B	17.5	0.50	192
<b>Neptune Road/Route 1A Off-ramp</b>	<b>D</b>	<b>39.9</b>		
Neptune EB left/thru   thru	A	3.4	0.08	m8
Neptune WB thru   thru/right	C	21.1	0.49	78
Off-Ramp NB left	E	79.7	0.90	#366
Off-Ramp NB thru/right	D	43.0	0.48	133

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

m = 95th percentile queue is metered by upstream traffic signal.

\* 25-foot left-turn pocket added during calibration process.



Table 7. Existing (2008) Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Pearl Street/Atlantic Avenue</b>	<b>A</b>	<b>0.9</b>		
Atlantic WB left/thru   thru   thru	A	0.9	0.45	16
<b>Pearl Street/Purchase Street</b>	<b>B</b>	<b>18.4</b>		
Pearl WB left	E	61.5	0.36	48
Pearl WB left/thru   thru	E	62.6	0.53	57
Purchase SB thru   thru   thru/right	B	13.2	0.70	204
<b>Seaport Boulevard/Atlantic Avenue</b>	<b>E</b>	<b>67.3</b>		
Seaport EB left/thru   thru	F	91.9	0.71	219
Seaport WB thru/bear right	F	141.1	1.19	#531
Seaport WB bear right/right	F	101.8	1.07	#445
Seaport WB right	A	6.3	0.46	55
Atlantic NB left/bear left	D	45.3	0.94	#594
Atlantic NB left/thru   thru/right	C	33.2	0.93	#483
<b>Oliver Street/Purchase Street</b>	<b>C</b>	<b>27.0</b>		
Oliver WB left/thru   thru	D	40.5	0.80	m91
Purchase SB thru   thru   thru/right	C	27.0	0.83	290
I-93 SWB left	B	12.3	0.48	205
I-93 SWB thru   right	D	39.4	0.59	#211
<b>High Street/Atlantic Avenue</b>	<b>B</b>	<b>11.2</b>		
High EB left   left	D	43.6	0.41	77
Atlantic NB thru   thru	A	3.6	0.45	m58
<b>High Street/Purchase Street</b>	<b>B</b>	<b>13.0</b>		
High EB thru   thru/right	B	16.8	0.50	68
Purchase SB left/thru   thru   thru	B	11.9	0.46	240
<b>Broad Street/Purchase Street</b>	<b>A</b>	<b>2.3</b>		
Broad EB right	A	2.3	0.38	0
Purchase SB thru   thru   thru/right	A	2.3	0.28	42
<b>East India Row/Atlantic Avenue</b>	<b>A</b>	<b>1.9</b>		
East India WB thru/right	C	26.1	0.22	29
Atlantic NB left/thru   thru/right	A	1.0	0.45	20
<b>India Street/SASB</b>	<b>A</b>	<b>9.1</b>		
India WB left   left	D	42.8	0.41	65
India WB thru	D	43.1	0.30	57
SASB SB thru   thru   thru/right	A	0.6	0.23	9
<b>Milk Street/Atlantic Avenue</b>	<b>C</b>	<b>23.3</b>		
Milk EB left   left	D	38.2	0.65	100
Milk EB thru	C	30.7	0.33	55
Milk WB right	A	2.0	0.31	0
Atlantic NB thru   thru/right	C	22.2	0.59	247
<b>Milk Street/SASB</b>	<b>B</b>	<b>16.8</b>		
Milk EB thru   thru/right	C	34.5	0.41	103
SASB SB left/thru   thru   thru	B	11.2	0.33	134
<b>State Street/Atlantic Avenue</b>	<b>A</b>	<b>4.1</b>		
State WB thru/right	C	21.5	0.26	72
Atlantic NB left/thru   thru   thru/right	A	2.7	0.37	72

Table 7. (cont.) Existing (2008) Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/SASB</b>	<b>B</b>	<b>11.2</b>		
State WB left	C	33.0	0.33	97
State WB thru   thru	C	31.2	0.34	74
SASB SB thru   thru   thru/right	A	5.4	0.38	131
<b>Mercantile Street/Atlantic Avenue/Cross Street</b>	<b>C</b>	<b>24.4</b>		
Mercantile EB left/thru   thru	D	54.7	0.61	117
Atlantic WB thru   thru/right	D	38.9	0.53	110
Atlantic NB left/thru   thru	B	15.2	0.32	163
Atlantic NB right	A	8.7	0.46	169
<b>Mercantile Street/SASB</b>	<b>A</b>	<b>8.4</b>		
Mercantile WB left   left	B	12.9	0.50	23
SASB SB left/thru   thru   thru	A	7.2	0.32	73
<b>Commercial Street/Cross Street</b>	<b>A</b>	<b>1.1</b>		
Commercial WB right	A	0.8	0.15	0
Cross NB thru   thru	A	1.2	0.29	44
<b>Clinton Street/SASB</b>	<b>C</b>	<b>29.7</b>		
I-93 WB left	D	51.1	0.73	223
I-93 WB left/thru	D	50.4	0.73	190
SASB SB thru   thru   thru/right	B	15.2	0.31	100
<b>Kneeland Street/SASB</b>	<b>D</b>	<b>42.7</b>		
Kneeland EB thru   thru	F	144.0	0.79	210
Kneeland EB right	B	15.4	0.77	107
Kneeland WB left	C	28.0	0.70	m82
Kneeland WB thru   thru	B	18.5	0.45	m116
SASB SB left/thru   thru   thru/right	C	26.6	0.80	#419
<b>Beach Street/SASB</b>	<b>A</b>	<b>8.5</b>		
Beach WB left	D	50.5	0.61	98
SASB SB thru   thru   thru	A	3.8	0.45	68
<b>Essex Street/Lincoln Street/SASB</b>	<b>C</b>	<b>30.9</b>		
Essex EB left (de facto)	D	53.9	0.87	294
Essex EB thru	C	32.1	0.47	167
Essex EB right/hard right	C	30.7	0.69	174
SASB SB left/thru   thru   thru/right	C	21.0	0.73	270
I-93 Ramp NWB left/thru   thru   thru/right	D	36.8	0.52	124
<b>Essex Street/South Street</b>	<b>B</b>	<b>15.4</b>		
Essex EB thru   thru/right	A	4.7	0.25	38
South WB left   left	D	50.5	0.33	71
<b>Summer Street/Purchase Street/SASB</b>	<b>C</b>	<b>34.8</b>		
Summer EB thru	E	59.2	0.71	#169
Summer EB right	B	11.1	0.36	24
Summer WB left	D	36.1	0.77	m#250
Summer WB left/thru   thru	C	27.5	0.77	m208
Purchase SB left/thru   thru/right	D	35.2	0.79	210
I-90 off-ramp SWB left/thru   thru/right	D	37.1	0.67	246

Table 7. (cont.) Existing (2008) Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/Purchase Street</b>	<b>F</b>	<b>106.7</b>		
Congress EB thru	C	33.7	0.66	254
Congress EB bear right (de facto)	F	220.8	1.40	#793
Congress EB right	C	28.0	0.34	132
Purchase SB hard left	B	14.4	0.62	206
Purchase SB left (de facto)	F	175.5	1.22	#881
Purchase SB left/thru   thru	B	10.9	0.50	159
<b>Kneeland Street/Lincoln Street</b>	<b>D</b>	<b>36.7</b>		
Kneeland EB left/thru   thru/right	D	42.0	0.81	271
Kneeland WB left/thru   thru   thru/right	D	52.2	0.82	186
Lincoln NB left/thru   thru	B	19.7	0.36	195
Lincoln NB right	A	4.9	0.19	23
<b>North Street/SASB</b>	<b>C</b>	<b>23.1</b>		
North Street EB right	A	9.4	0.17	m124
I-93 WB left/thru   thru	A	5.7	0.21	82
SASB SB thru   thru/right	D	44.1	0.77	179
<b>North Street/Cross Street</b>	<b>D</b>	<b>40.8</b>		
I-93 EB left	C	29.1	0.52	252
I-93 EB left/thru	C	30.4	0.57	223
Cross NB thru   thru/right	D	48.2	0.80	307
<b>Hanover Street/SASB</b>	<b>A</b>	<b>9.0</b>		
Hanover EB thru   thru/right	B	18.9	0.15	30
Hanover WB left	B	16.9	0.27	m59
Hanover WB thru	B	16.2	0.20	m66
SASB SB left/thru   thru/right	A	3.5	0.28	m27
<b>Hanover Street/Cross Street</b>	<b>B</b>	<b>12.6</b>		
Hanover EB left	D	38.3	0.29	44
Hanover EB thru	D	35.8	0.29	71
Hanover WB thru/right	D	45.5	0.76	176
Cross NB left/thru   thru/right	A	4.3	0.63	272
<b>New Sudbury Street/SASB</b>	<b>D</b>	<b>37.8</b>		
New Sudbury EB thru   thru	B	12.4	0.41	183
New Sudbury EB right	A	4.0	0.34	36
SASB SB left/thru   thru	D	42.2	0.75	156
Haymarket Station SEB right	F	227.9	1.31	39
<b>New Sudbury Street/Cross Street</b>	<b>B</b>	<b>12.1</b>		
New Sudbury EB left   left	B	12.8	0.48	254
Cross NB left/thru   thru	B	11.6	0.83	373
<b>New Chardon Street/SASB</b>	<b>F</b>	<b>146.7</b>		
New Chardon EB bear right   bear right	F	387.1	1.28	#638
New Chardon EB right	C	29.5	0.26	58
SASB SB left   left	B	16.4	0.69	119
SASB SB thru/right	C	20.3	0.69	109
SASB SB right	C	20.3	0.68	102
I-93 NWB left   left	D	35.6	0.88dl	162

Table 7. (cont.) Existing (2008) Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>North Washington Street/Cross Street</b>	<b>B</b>	<b>11.6</b>		
Cooper Street WB right	A	1.2	0.18	0
I-93 NB thru   thru	D	45.9	0.51	74
Cross NWB bear right   bear right	A	6.5	0.64	127
<b>North Washington Street/Beverly Street</b>	<b>B</b>	<b>15.7</b>		
N. Washington SB thru   thru   thru	B	15.5	0.51	199
Beverly SEB right   right   right	B	16.4	0.26	m63
<b>Valenti Way/Beverly Street</b>	<b>A</b>			
Valenti WB left   left/thru   thru	A	0.6	0.21	20
<b>Valenti Way/North Washington Street</b>	<b>B</b>	<b>18.9</b>		
N. Washington NB left/thru   thru/right	C	20.7	1.07dl	#254
N. Washington SB left/thru   thru   thru/right	B	17.2	0.82	406
<b>Congress Street/Atlantic Avenue</b>	<b>B</b>	<b>17.4</b>		
Congress EB left   left	D	35.4	0.83	210
Congress EB thru   thru	A	6.6	0.46	71
Congress WB right   right	A	2.1	0.40	m5
Atlantic NB thru   thru   thru/right	C	21.1	0.81	239
<b>Summer Street/Atlantic Avenue</b>	<b>C</b>	<b>32.8</b>		
Summer EB left/thru   thru	D	36.2	0.62	m205
Summer WB thru   thru   thru/right	C	32.7	0.51	155
Atlantic NB left/thru   thru   thru	C	30.3	0.81	182
Atlantic NB right	D	36.0	0.73	m204
<b>Essex Street/Atlantic Avenue</b>	<b>C</b>	<b>25.3</b>		
Essex EB left   left	E	56.6	0.74	163
Atlantic NB left/thru   thru   thru	B	13.4	0.36	180
<b>Beach Street/Atlantic Avenue</b>	<b>A</b>	<b>5.6</b>		
Atlantic NB left/thru   thru   thru	A	5.6	0.36	78
<b>Kneeland Street/Atlantic Avenue/I-90 WB Off-Ramps</b>	<b>D</b>	<b>42.6</b>		
Kneeland EB left	F	88.8	0.93	m#217
Kneeland EB left/thru	E	79.5	0.89	m#210
MBTA Drive WB thru/right	D	40.0	0.10	8
Frontage NB left	C	29.1	0.35	163
Frontage NB left/thru	C	31.5	0.48	217
I-90 WB Off-Ramp NWB left	D	48.3	0.71	180
I-90 WB Off-Ramp NWB thru	B	12.5	0.42	195
<b>North Street/Clinton Street</b>	<b>C</b>	<b>21.4</b>		
North EB thru	B	12.2	0.15	82
North WB thru   thru	B	10.3	0.26	m100
Clinton NB left   left/right	D	39.8	0.70	136
<b>Purchase Street/Fire Station</b>	<b>A</b>			
Fire Station EB right	B	10.8	0.26	26
Purchase SB thru   thru   thru/right	A	0.0	0.33	0

Table 7. (cont.) Existing (2008) Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/Congress Street</b>	<b>C</b>	<b>32.2</b>		
State WB left/thru   thru/right	D	42.3	0.80	232
Congress NB thru   thru	B	14.9	0.42	77
Congress SB thru   thru/bear right	B	16.0	0.55	170
Congress SB right	B	17.6	0.54	229
<b>North Street/Congress Street</b>	<b>B</b>	<b>11.7</b>		
North WB left   left/right	B	19.3	0.82	27
Congress NB thru   thru   thru/right	A	4.7	0.46	19
Congress SB left/thru   thru   thru	B	11.9	0.59	60
<b>North Street/Union Street</b>	<b>B</b>	<b>19.2</b>		
North EB left/thru   thru	A	0.6	0.06	0
North WB thru   thru/left	C	22.4	0.62	108
<b>Hanover Street/Congress Street</b>	<b>A</b>	<b>2.9</b>		
Hanover WB left	B	17.7	0.25	75
Congress NB thru   thru   thru/right	A	0.4	0.29	0
Congress SB thru   thru   thru	A	2.8	0.23	33
<b>New Sudbury Street/Congress Street/Merrimac Street</b>	<b>D</b>	<b>54.2</b>		
New Sudbury EB left	F	137.0	1.15	#375
New Sudbury EB thru   thru	D	46.5	0.75	202
New Sudbury EB right	A	9.3	0.53	34
Congress NB thru   thru	D	45.4	0.72	270
Congress NB right (de facto)	E	77.2	0.95	#351
Merrimac SB left	D	45.1	0.65	m79
Merrimac SB thru   thru   thru	B	17.2	0.20	m59
<b>New Chardon Street/Merrimac Street</b>	<b>E</b>	<b>57.8</b>		
New Chardon EB left/thru   thru/right	A	8.8	0.75	2
New Chardon WB hard left/left	F	192.9	1.27	60
New Chardon WB thru   thru/right	B	1531	0.31	92
Merrimac NB hard left/left	C	24.0	0.74	m121
Merrimac NB thru	B	19.8	0.62	m100
Merrimac NB right (de facto)	B	19.1	0.55	m104
Merrimac SB left (de facto)	F	216.3	1.18	#337
Merrimac SB thru   thru/right	D	35.4	0.58	114
<b>Summer Street/Dorchester Avenue</b>	<b>D</b>	<b>36.2</b>		
Summer EB left/thru   thru/right	D	44.8	0.71	#330
Summer WB left/thru   thru/right	C	22.8	0.70	#274
Dorchester NB left/thru/right	B	17.4	0.33	37
Dorchester SB left	E	70.0	0.91	m#290
Dorchester SB left/thru/right	B	16.3	0.28	m75
<b>Summer Street/Melcher Street</b>	<b>C</b>	<b>22.5</b>		
Summer EB thru   thru/right	B	11.5	0.50	m182
Summer WB left/thru   thru	C	21.3	0.39	216
Melcher NB left/right	D	53.4	0.83	250

Table 7. (cont.) Existing (2008) Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Summer Street/Pump House Road</b>	<b>B</b>	<b>17.9</b>		
Summer EB left/thru   thru	B	12.5	0.43	236
Summer WB thru   thru   thru/right	B	11.6	0.29	153
Driveway NB left/thru/right	—	—	—	—
Pump House SB left	D	46.7	0.65	147
Pump House SB left/right	D	36.5	0.59	121
<b>Massport Haul Road/Pump Station Connector</b>	<b>B</b>	<b>13.0</b>		
Haul EB thru	B	12.9	0.06	29
Haul EB right	A	3.1	0.25	48
Haul WB left	A	6.3	0.10	47
Haul WB thru	A	6.2	0.15	90
Pump Station NB left   left/right	C	30.5	0.51	47
<b>Summer Street/D Street</b>	<b>C</b>	<b>24.4</b>		
Summer EB left	B	16.1	0.61	155
Summer EB thru   thru/right	A	7.5	0.40	141
Summer WB left/thru   thru	C	33.4	0.49	146
Summer WB right	C	25.0	0.22	189
D Street NB left	D	47.6	0.52	89
D Street NB thru   thru/right	D	41.0	0.49	102
D Street SB left	D	40.6	0.71	m119
D Street SB left/thru   thru/right	C	25.0	0.68	m58
<b>Ramp DB (I-90 WB On Ramp)/D Street</b>	<b>B</b>	<b>16.7</b>		
D Street NB left	E	71.2	0.90	#319
D Street NB thru   thru	A	2.2	0.16	82
D Street SB thru   thru/right	A	8.8	0.47	371
<b>Transitway/D Street</b>	<b>A</b>	<b>7.8</b>		
Transitway EB thru	D	47.1	0.34	43
Transitway WB thru	D	48.4	0.40	50
D Street NB thru   thru   thru/right	A	6.2	0.16	5
D Street SB thru   thru	A	5.1	0.39	147
<b>Congress Street/D Street</b>	<b>D</b>	<b>42.8</b>		
Congress EB left/thru   thru/right	D	44.0	0.45	100
Congress EB right	C	23.9	0.54	m204
Congress WB left/thru   thru/right	D	42.7	0.66	94
D Street NB left	E	63.6	0.87	#241
D Street NB left/thru   thru/right	D	36.5	0.71	176
D Street SB left/thru   thru/right	D	50.2	0.84	#264
<b>Congress Street/B Street/Ramps D&amp;F</b>	<b>C</b>	<b>32.9</b>		
Congress EB left/thru   thru	D	51.7	0.75	211
Congress EB right	B	14.0	0.47	m95
Congress WB left	C	33.4	0.62	275
Congress WB left/thru   thru/right	C	26.5	0.52	215
Ramp NB left	E	57.4	0.67	139
Ramp NB thru	C	23.5	0.18	60
Ramp NB right	A	5.0	0.45	29
B Street SB thru   thru	D	51.7	0.58	94
B Street SB right	C	20.0	0.25	32

Table 7. (cont.) Existing (2008) Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/East Service Road/Ramps I&amp;C</b>	<b>C</b>	<b>24.9</b>		
Congress EB left	B	16.7	0.06	m21
Congress EB thru   thru	B	14.3	0.19	m103
Congress WB thru   thru	B	12.2	0.17	m85
Congress WB right	A	7.3	0.04	m10
Ramp I NB left/thru   thru	D	44.6	0.34	52
Ramp I NB right	B	14.2	0.50	36
Ramp C NEB thru   thru/right	D	42.6	0.70	119
<b>Congress Street/Boston Wharf Road</b>	<b>C</b>	<b>28.2</b>		
Congress EB left/thru	C	35.3	0.54	m224
Congress EB right	B	12.1	0.40	m78
Congress WB left	D	38.7	0.44	88
Congress WB thru   thru/right	C	24.0	0.25	132
Boston Wharf NB left	D	37.0	0.16	52
Boston Wharf NB thru/right	C	22.7	0.11	13
Boston Wharf SB left/thru	D	40.7	0.77	243
Boston Wharf SB right	A	5.6	0.18	24
<b>Seaport Boulevard (Northern Avenue)/ B Street</b>	<b>C</b>	<b>22.0</b>		
Seaport EB thru   thru/right	B	16.6	0.62	210
Seaport WB left/thru   thru	B	18.7	0.57	181
B Street NB left   left	D	48.3	0.70	110
B Street NB right	B	11.4	0.45	m32
<b>Seaport Boulevard/Northern Avenue/East Service Road</b>	<b>C</b>	<b>26.2</b>		
Seaport EB left	B	14.4	0.24	24
Seaport EB thru   thru	B	13.9	0.50	134
Seaport WB thru   thru/right	C	25.2	0.75	#405
East Service NB left	D	51.3	0.66	171
East Service NB thru	D	36.3	0.11	m22
East Service NB right	C	23.0	0.58	80
Northern SB left	D	49.1	0.63	158
Northern SB left/right	D	36.6	0.57	142
<b>Seaport Boulevard/Sleeper Street</b>	<b>B</b>	<b>13.4</b>		
Seaport EB left/thru   thru	A	9.1	0.42	m154
Seaport EB right	A	1.4	0.10	m12
Seaport WB left	A	3.6	0.01	m2
Seaport WB thru   thru/right	A	5.4	0.35	88
Sleeper NB left/thru/right	E	59.7	0.79	95
Sleeper SB left/thru	D	35.5	0.32	56
Sleeper SB right	B	12.7	0.56	70
<b>Congress Street/Dorchester Avenue</b>	<b>C</b>	<b>30.9</b>		
Congress EB thru   thru/right	A	7.5	0.42	61
Congress WB left/thru	D	49.2	0.91	m#223
Dorchester NB left/right	E	60.5	0.82	273

Table 7. (cont.) Existing (2008) Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/A Street</b>	<b>E</b>	<b>73.5</b>		
Congress EB left/thru   thru	C	22.9	0.36	m126
Congress EB right	B	3.1	0.25	m8
Congress WB left	B	14.2	0.55	79
Congress WB thru/right	A	9.1	0.24	64
A Street NB left/thru/right	F	219.7	1.38	99
Thompson SB left/thru/right	C	29.2	0.22	31
<b>Summer Street/West Side Drive</b>	<b>A</b>	<b>6.5</b>		
Summer EB thru   thru/right	A	7.7	0.44	m32
Summer WB left	A	3.9	0.11	4
Summer WB thru   thru	A	2.1	0.20	31
West Side NB left	D	40.7	0.10	30
West Side NB right	B	14.8	0.23	11
<b>Summer Street/WTC Avenue</b>	<b>B</b>	<b>13.6</b>		
Summer EB left	B	13.0	0.06	22
Summer EB thru   thru	B	13.8	0.36	158
Summer EB right	A	6.5	0.16	42
Summer WB left	A	7.7	0.25	m55
Summer WB thru   thru/right	B	12.5	0.22	146
WTC NB left	D	44.6	0.29	49
WTC NB thru/right	A	0.2	0.09	0
WTC SB left	D	45.0	0.28	42
WTC SB thru/right	B	19.0	0.13	0
<b>Seaport Boulevard/Boston Wharf Road</b>	<b>C</b>	<b>24.0</b>		
Seaport EB thru   thru/right	C	29.3	0.45	m#215
Seaport WB left	B	16.4	0.20	m79
Seaport WB thru   thru	B	16.6	0.38	258
Boston Wharf NB left   left/right	D	43.8	0.49	87
<b>SSCONN/Albany Street</b>	<b>A</b>	<b>9.8</b>		
SSCONN WB left   left	D	47.5	0.44	62
Albany SB thru   thru   thru/right	A	6.5	0.44	268
<b>Broadway Bridge/Frontage Road</b>	<b>E</b>	<b>68.6</b>		
Traveler EB hard left	F	178.8	0.49	57
Traveler EB left	F	326.3	0.69	m156
Traveler EB thru   thru	C	21.4	0.44	m221
Broadway WB right	C	21.4	0.09	42
Broadway WB hard right (de facto)	F	99.7	1.09	#564
Frontage NB thru   thru	B	11.5	0.03	m4
Frontage NB right   right   right/hard right	B	18.7	0.64	52
<b>Bennington Street/Neptune Road</b>	<b>E</b>	<b>77.0</b>		
Bennington EB left/thru   thru/right	D	45.6	0.26	60
Bennington WB left/thru   thru/right	E	78.6	0.82	m41
Neptune NB left/thru   thru/right	F	132.0	1.18	#535
Neptune SB left/thru   thru/right	B	18.5	0.52	237



Table 7. (cont.) Existing (2008) Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>SSECONN/Ramps K&amp;X</b>	<b>B</b>	<b>15.5</b>		
SSECONN EB left/thru	C	34.8	0.23	15
SSECONN EB right	C	24.9	0.56	99
SSECONN WB left	D	54.1	0.44	35
SSECONN WB thru/right	C	28.7	0.51	55
Ramp NB left/thru   thru/right	A	8.8	0.24	122
Ramp SB left	A	9.8	0.02	7
Ramp SB left/thru   thru/right	A	5.1	0.10	31
<b>East Berkeley Street/Albany Street</b>	<b>B</b>	<b>16.0</b>		
East Berkeley WB left/thru   thru   thru	A	4.9	0.48	28
Albany SB thru   thru   thru/right	C	30.6	0.50	m92
<b>West 4<sup>th</sup> Street/Frontage Road</b>	<b>C</b>	<b>23.7</b>		
West 4 <sup>th</sup> WB thru   thru   thru/right	D	42.0	0.82	259
Frontage NB left	A	4.0	0.36	m89
Frontage NB thru   thru/right	B	14.8	0.63	#464
<b>Traveler Street/Albany Street</b>	<b>E</b>	<b>68.2</b>		
Traveler EB thru/right	F	388.7	1.05	#317
Albany SB left	A	3.4	0.52	31
Albany SB left/thru   thru/right	A	6.9	0.47	238
<b>Herald Street/Albany Street</b>	<b>C</b>	<b>25.1</b>		
Herald EB right   right   right	B	10.9	0.58	251
Albany SB thru   thru   thru	D	42.3	0.76	272
<b>MBTA Bus Lot (near Randolph)/Albany Street</b>	<b>F</b>	<b>140.1</b>		
MBTA EB thru/right	C	31.6	0.08	11
Albany SB left	A	3.0	0.29	16
Albany SB left/bear left   bear left	B	11.5	0.29	90
Albany SB thru/right	A	4.5	0.40	132
Albany NB right   right	F	301.4	1.40	m#354
<b>Ramp A2/Ramp I/Frontage Road</b>	<b>C</b>	<b>26.1</b>		
Frontage SB thru	B	15.9	0.36	153
Frontage SB right	A	6.2	0.23	56
Ramp SWB left/thru   thru	C	30.3	0.89	316
<b>Nashua Street/Martha Road</b>	<b>B</b>	<b>12.7</b>		
Nashua WB left   left	B	19.8	0.75	135
Martha SB thru   thru	A	4.8	0.27	96
<b>Chelsea Street/Rutherford Avenue/North Washington Street</b>	<b>C</b>	<b>34.0</b>		
Chelsea WB left	F	155.6	1.23	#580
Chelsea WB thru	E	61.4	0.90	#424
Chelsea WB right	B	14.3	0.61	70
N. Washington NB thru   thru   thru	C	21.1	0.55	214
N. Washington NB right	A	4.8	0.61	28
Rutherford SB left	E	61.7	0.80	m135
Rutherford SB thru   thru   thru	A	6.9	0.30	m66
Rutherford SB right	A	5.4	0.41	m71

Table 7. (cont.) Existing (2008) Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>LT-TL/Rutherford Avenue</b>	<b>C</b>	<b>34.6</b>		
Ramp EB left   left	D	35.3	0.32	90
Ramp EB right   right	A	5.8	0.44	25
Rutherford NB left	F	115.1	1.16	m#647
Rutherford NB thru   thru   thru   thru	A	1.8	0.25	26
Rutherford SB thru   thru   thru   thru	D	41.1	0.93	#409
Rutherford SB right	B	13.2	0.64	320
<b>Albany Street/Frontage Road</b>	<b>B</b>	<b>13.8</b>		
Albany EB left   left	A	8.7	0.86	m5
Albany EB thru	A	6.5	0.02	m1
Albany WB right	B	12.1	0.19	2
Frontage NB thru   thru   thru/right	B	19.4	0.46	245
<b>Neptune Road/Route 1A Off-ramp</b>	<b>E</b>	<b>70.4</b>		
Neptune EB left/thru   thru	A	3.3	0.04	m2
Neptune WB thru   thru/right	B	10.2	0.53	96
Off-Ramp NB left	F	170.2	1.10	#622
Off-Ramp NB thru/right	E	58.9	0.83	#416

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

m = 95th percentile queue is metered by upstream traffic signal.

\* 25-foot left-turn pocket added during calibration process.

At Seaport Boulevard/Atlantic Avenue, the overall intersection operates at LOS F and E in morning and evening peak hours, respectively. During the both peak hours, the Seaport Boulevard eastbound approach and the Seaport Boulevard westbound through/bear right movement operate at LOS F. The poor levels of service are due to insufficient green time given to the approaches and poor coordination with adjacent intersections in the eastbound/westbound direction.

Oliver Street/Purchase Street operates at a LOS F during the morning peak hour. This is due to the Oliver Street westbound approach and the I-93 off-ramp left-turn movement also operating at LOS F. Adding more green time and improving coordination with adjacent intersections in the eastbound/westbound directions will improve the level of service.

During the morning peak hour, Mercantile Street/SASB operates at LOS F. This is due to the SASB left-turn/through movements operating at LOS F. Coordinating the southbound movement with adjacent intersections will alleviate some of the problem.

During the morning peak hour, Clinton street/SASB operates at LOS F. This is due to the SASB operating at LOS F, and the I-93 left-turn and through movement operating at LOS E. Improving coordination will help alleviate some of the problem.

During the morning hour, the Kneeland Street westbound through movement at Kneeland Street/SASB operates at a LOS F during the morning peak hour due to insufficient green time. During the evening peak, Kneeland Street eastbound through movement operates at LOS F. The main cause for delay is inadequate coordination with adjacent intersections in the eastbound direction.

During the evening peak hour Congress Street/Purchase Street operates at LOS F. This can be attributed

to the high Congress Street eastbound left turn volumes and Purchase Street southbound left turn volumes. Both of these movement operate at LOS F. Adding more time to these phases will improve operations.

Kneeland Street/Lincoln Street operates at LOS E during the mid-day peak hour. This is due to the eastbound through/right-turn movement operating at LOS F. Adding more time to the eastbound phase may help to decrease delays.

At New Sudbury Street/SASB, the Haymarket Station approach operates at LOS F during the morning and mid-day peak hours.

During the evening peak hour, the SASB approach at New Chardon Street/SASB operates at LOS F. This is due to the New Chardon eastbound bear right movement operates at LOS F. Adding time to the respective phases will help decrease delay.

Valenti Way/North Washington Street, the North Washington Street northbound de facto left-turn movement operates at LOS F. This is due to poor signal timing for the north and southbound approaches. It is suggested that more time be given to the North Washington northbound approach.

The Summer Street/Atlantic Avenue operates at LOS E during the morning peak hour. This is due to the Atlantic Avenue northbound left-turn, through, and right-turn movements operate at LOS F during the morning peak hour. This is due to an insufficient amount of time given to this approach.

During the morning peak hour, Kneeland Street/Atlantic Avenue/I-93 Ramps operates at LOS E. At Kneeland Street/Atlantic Avenue/I-93 Ramps, the Kneeland Street eastbound approach left-turn and through movements operate at LOS E or F during all peak hours. Also, the I-90 northbound left-turn movement operates at LOS F in the morning peak hour. Adding more time to these phases and improving coordination with adjacent intersection for the eastbound movement will alleviate the problem.

During the morning peak hour, State Street westbound approach at State Street/Congress Street operates at a LOS F. Adding more time to the westbound phase will help alleviate some of the problem.

The Congress Street southbound approach at Congress Street/North Street operates at LOS F. Adding more time to these phases will help decrease the delay.

At New Sudbury Street/Congress Street/Merrimac Street, the New Sudbury Street eastbound left-turn movement operates at LOS F during the evening peak hour. Adding more time to the eastbound phase may help alleviate the problem.

At New Chardon Street/Merrimac Street, northbound hard left/left-turn approach operates at a LOS F during the morning and mid-day peak hours. This is due to the high numbers of vehicles that turn left during the morning and mid-day from the northbound approach. Adding more time to the northbound phase will help alleviate some of the problem. During the evening peak hour, the Merrimac Street southbound de facto left-turn is operating at a LOS F. Adding more time to the southbound phase may help alleviate some of the problem.

During the morning peak hour, Summer Street/Dorchester Avenue operates at LOS E. Most of the delay is due to the Dorchester Avenue southbound left turn movement, which operates at LOS F. Adding more time to the northbound and southbound phases may help decrease delay.

Congress Street/B Street/Ramps D&F operates at LOS E during the morning peak hour. The northbound left turn operates at LOS F. This is due to the high number of vehicle that turn left from the northbound approach. Adding more time to the northbound phase will help alleviate some of the problem.

During the morning peak hour, Congress Street/East Service Road/Ramps I&C operates at LOS E. Most of the delay is caused by Ramp C, which is at LOS F. Adding more time to this phase may help decrease the delay.

During the evening peak hour, Congress Street/A Street operates at LOS E. This is mainly due to the A Street northbound approach. This approach operates at LOS F during the morning and evening peak hours. Adding more time to this phase may help decrease the delay.

Broadway Bridge/Frontage Road NB operates at LOS F during the all peak hours. This is mostly due to the Traveler Street eastbound left turn and the Broadway Bridge hard right-turn volumes. Improving coordination may help decrease delay.

Bennington Street/Neptune Road operates at LOS F during the morning peak hour. This is due to the heavy volumes turning left on the southbound approach.

At West 4<sup>th</sup> Street/Frontage Road, the westbound approach operates at LOS F during the morning peak hour. Giving more time to this phase will help decrease delay.

At Traveler Street/Albany Street, the Traveler Street eastbound approach operates at LOS F during the evening peak hour. Adding more time to this approach will help alleviate some of the problem.

MBTA Bus Lot (near Randolph)/Albany Street operates at LOS F during the all peak hours due to excessive delay on the Albany Street northbound approach. Giving more time to this approach will help alleviate some of the problem.

At Chelsea Street/Rutherford Avenue/North Washington Street, the westbound and southbound left turn movements operate at LOS F. Improving coordination and giving more time to these phases may help alleviate some of the problem.

At LT-TL/Rutherford Avenue, the northbound left turn movement operates at LOS F during the mid-day and evening peak hours. Giving more time to this phase will help decrease the delay.

## Re-timing Objectives

The Central Artery traffic signals have both high vehicle volumes in some areas as well as heavy pedestrian traffic, making it crucial to service both types of transportation. While progression throughout the area is of importance, pedestrian safety concerns must be noted. Currently, some of the signals within the study area are out of date and do not currently meet MUTCD standards. One of HSH's objectives is to bring all of the locations up to code. For example, many of the intersections in the study area have All-Red clearance times that are too short. By bringing the clearance times up to standard, the number of angle crashes at these locations can be reduced. Updating the Flashing Don't Walk clearance times will also make it safer for pedestrians.

Areas that need improvement were noted from field observations, the Existing Conditions Synchro analysis, and the time-delay trials. Three major corridors in the study area are crucial to the progression throughout the Central Artery and Financial District: Congress Street, Surface Artery Southbound, and Atlantic Avenue. While HSH does not want to increase speeds along these corridors, improving timing between intersections will help in reduction of delay, fuel consumption, and CO emissions.

## Phase 1 Improvements

Improvements identified in Phase 1 consisted of changes to *turn on red restrictions, pedestrian recall operation, splits, offsets, cycle lengths, and clearance intervals*.

## ***Pedestrian Recall Operation***

Currently, most intersections within the study area that have exclusive pedestrian phases operate on pedestrian recall from 7 a.m. to 8 or 10 p.m. Due to the high volumes of pedestrians in this area, HSH recommends that this setup should remain. HSH proposes that the exclusive pedestrian phase at Atlantic Avenue/Pearl Street, Atlantic Avenue/Essex Street, and Atlantic Avenue/Beach Street be set to pedestrian recall between the hours of 7 a.m. to 8 p.m. so that pedestrians will not have to push the button to cross during these times.

## ***Turn on Red Restrictions***

### **Essex Street/Lincoln Street/SASB**

The right-turns on the eastbound Essex Street approach are currently controlled by a traffic signal that has green, yellow, and red right-arrows. According to the 11/1/03 version of the *City of Boston Traffic Rules and Regulations*, turns on red arrows are prohibited. However, many drivers continue to turn right on red at this approach. Drivers making this illegal turn onto SASB create a potential conflict with pedestrians who are legally crossing in the crosswalk during their walk phase. In addition, many vehicles that are turning right on red are not just turning onto SASB, but actually crossing Surface Artery to turn onto the Interstate 93 South On-Ramp. Due to the number of pedestrians that cross the surface artery and the geometry of the intersection, HSH recommends adding a No Turn on Red sign to further emphasize this restriction.

### **Albany Street Extension/Frontage Road NB**

The Public Works driveway approach to this intersection has limited sight distance to the south due to some of the concrete structures supporting the overhead highway. This location has a high crash rate, as discussed below. Therefore, HSH recommends implementing No Turn On Red out of the Public Works driveway.

## ***Clearance Intervals***

The Yellow, All-Red, and Flashing Don't Walk Clearance Intervals were recalculated and updated at all locations. The Yellow interval was determined based upon a 30 m.p.h. traveling speed. The All-Red interval was calculated based on intersection geometry and posted speed limit. Flashing Don't Walk times were calculated based upon the *Manual on Uniform Traffic Control Device's* recommended pedestrian travel time of 4 feet per second. HSH proposes to extend Walk times and Flashing Don't Walk times to account for either a walking speed of 3.5 feet per second at a crosswalk or 4 feet per second diagonally across the intersection at certain locations that have excess capacity upon BTD's approval.

Many of the locations have All-Red intervals that are too short for vehicles that arrive at the end of the yellow period to safely cross the intersection before the next conflicting phase begins. For example, at Bennington Street/Neptune Road in East Boston, the All-Red time is currently set at 1 second. Based on the posted speed limit and the distance from the stop-bar to the far side of the crosswalk on the opposite side of the street, all phases at this intersection should have an All-Red time of 3 seconds. At this intersection there were 15 reported crashes within the past 2 years of available data. Increasing the All-Red interval should lower the likelihood of angle crashes at this intersection.

## *High Crash Locations*

### **Kneeland Street/SASB**

Kneeland Street/SASB exceeds the District 4 crashes rate with a rate of 1.05 crashes per million entering vehicles. At this location, 12 of the 25 known crashes in the past 3 years were classified as sideswipe crashes. These types of crashes between vehicles traveling in the same direction are most likely due to vehicles trying to maneuver around traffic waiting to make a left turn. 6 of the 25 known crashes were classified as angle crashes. Since the vehicle indications are mast-arm mounted at this location, these types of crashes are most likely caused by drivers accepting gaps that are too small to safely make a left turn. HSH recommends increasing the clearance intervals at this location.

### **Congress Street/Purchase Street**

Congress Street/Purchase Street exceeds the District 4 crashes rate with a rate of 0.95 crashes per million entering vehicles. Of the 27 known crashes at Congress Street/Purchase Street, 7 were classified as angle crashes, 8 were rear-end crashes, and 11 were sideswipe crashes. At this intersection, the sideswipe crashes are most likely caused by vehicles attempting to maneuver to or away from the I-90 off-ramp. The southbound Purchase Street approach consists of an exclusive left-turn lane, a shared bear left/through lane, and a through lane. However, many vehicles use the exclusive left-turn lane to bear left onto I-90 causing 2 lanes to merge into 1 receiving lane on the I-90 ramp. HSH recommends adding advanced warning signs and pavement markings may help to decrease sideswipe crashes.

### **Broadway Bridge/Frontage Road NB**

Broadway Bridge/Frontage Road NB exceeds the District 4 crashes rate with a rate of 2.16 crashes per million entering vehicles. Of the 50 known crashes, 37 were classified as angle crashes. Due to the highway structure above this intersection, visibility of vehicle indications is a major issue at this intersection. HSH recommends that the Massachusetts Turnpike Authority (MTA) evaluate possible alternatives to improve the visibility of vehicle indications.

### **Bennington Street/Neptune Road**

At Bennington Street/Neptune Road, there were 15 crashes within the past 2 years, which is a crash rate of 1.11 crashes per million entering vehicles over the 2 year time period. Of the 11 known crashes, 5 were classified as angle crashes, and 4 were classified as rear-end crashes. Since mast-arms are provided at this intersection, visibility is not likely a factor. Clearance times are mostly the cause of crashes at this intersection. Currently, this intersection has a 4 second yellow and a 1 second all-red time for all vehicle phases. Due to the size of this intersection, HSH recommends increasing the all-red time to 3 seconds for all phases.

### **West 4<sup>th</sup> Street/Frontage Road Northbound**

West 4<sup>th</sup> Street/Frontage Road NB exceeds the District 4 crashes rate with a rate of 2.32 crashes per million entering vehicles. Of the 55 known crashes, 42 were classified as angle crashes. As with Broadway Bridge/Frontage Road NB, visibility of vehicle indications is a major issue at this intersection. HSH recommends that the MTA evaluate possible alternatives to improve the visibility of vehicle indications.

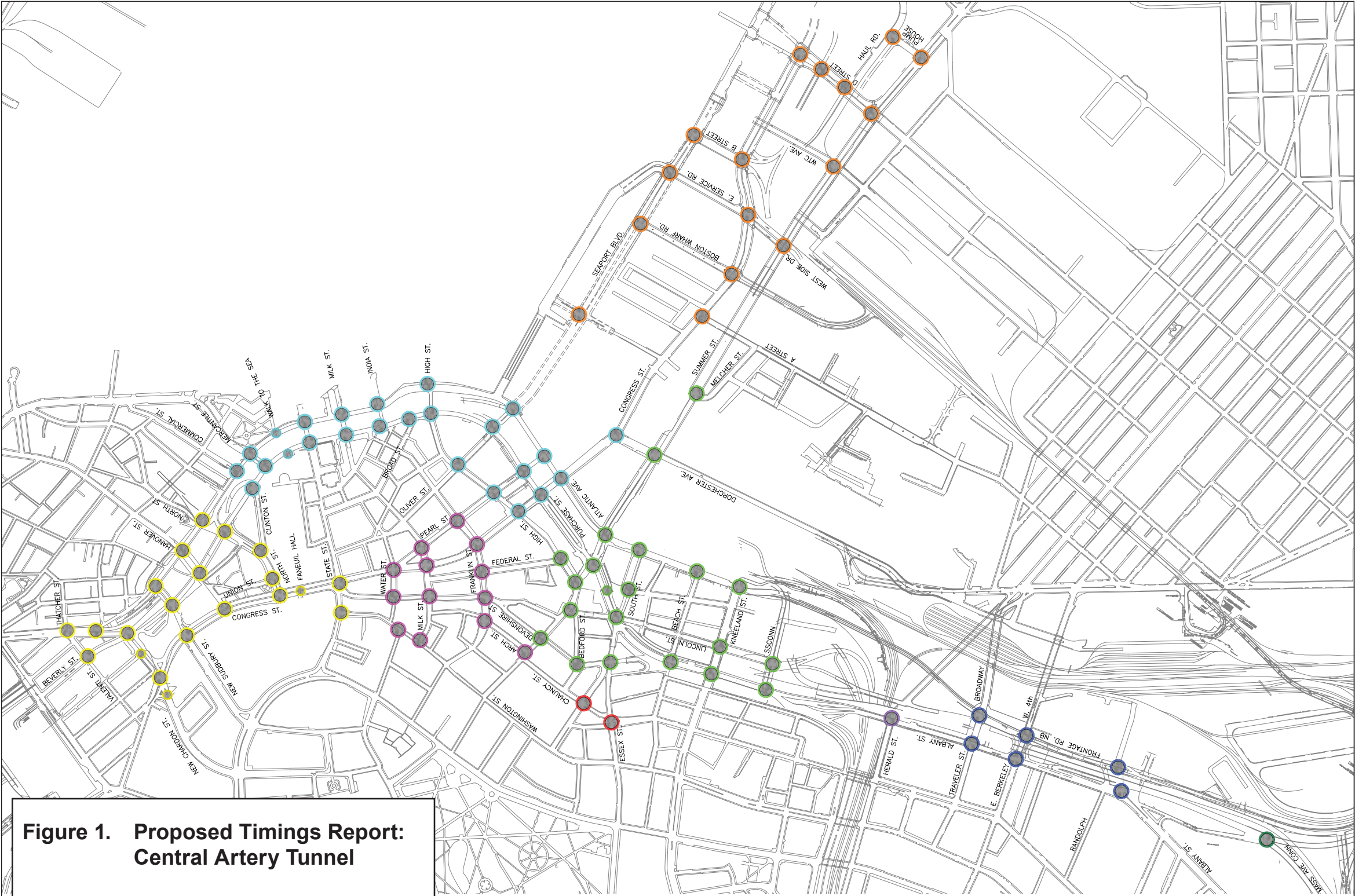
### **Albany Street Extension/Frontage Road NB**

Albany Street/Frontage Road NB exceed the District 4 crash rate with a rate of 0.93 crashes per million entering vehicles. Of the 21 known crashes, 9 were classified as angle crashes, and 7 were classified as sideswipe crashes. HSH recommends implementing No Turn On Red out of the Public Works driveway as stated previously.

### *Traffic Signal Sections*

In order to optimally time the Central Artery intersections and improve progression throughout the area, intersections from Work Order #7 in the Financial District will be coordinated along with the above intersections during the morning and evening peak hours. With the guidance of BTM, HSH proposes new groupings for the traffic signal sections within the study area. **Figure 1** shows the proposed sections including the addition of 2 new sections.





- SECTION 9
- SECTION 10
- SECTION 11
- SECTION 13
- SECTION 14
- SECTION 19
- NEW HAYMARKET SECTION
- NEW SOUTH BOSTON SECTION
- NEW WIDETT CIRCLE SECTION

**Figure 1. Proposed Timings Report:  
Central Artery Tunnel**



Not to scale.

## *Cycle Length*

Minimizing the cycle length at an intersection will help to reduce delays for pedestrians, queue lengths for vehicles, and helps to reduce vehicular delay as well. In order to improve progression throughout the network, the majority of the intersections need to run on the same cycle length or a half cycle.

### **80-second Cycle**

For the network to progress and work efficiently, the cycle length cannot be lower than 90 seconds due to the number of phases, and the minimum timings needed for each phase due to concurrent pedestrian phases at some locations. While many of the intersections can operate at an 80-second cycle, some key intersections that rely on coordination to operate acceptably have minimums that exceed 80 seconds. These locations include: Seaport Boulevard/Atlantic Avenue, Essex Street/Lincoln Street/SASB, Kneeland Street/Lincoln Street, Congress Street/Atlantic Avenue, New Sudbury Street/Congress Street/ Merrimac Street, New Chardon Street/Merrimac Street.

### **90-second Cycle**

At locations with ramps, such as Oliver Street/Purchase Street and Summer Street/Purchase Street, a cycle length of 90 seconds is too short to accommodate the high number of vehicles during the morning and evening peak hours, resulting in a poor overall LOS. For the mid-day peak hour, a 90-second cycle is chosen because vehicle volumes are lower. Pedestrians benefit from the lower cycle length with a decrease in delay.

### **100-second Cycle**

A cycle length of at least 100 seconds is necessary during the morning and evening peak periods. After testing a 100-second and a 110-second cycle for the network, HSH found that there is not a significant difference between the total delays for the two trials. Due to the large amount of pedestrian traffic in the area, HSH recommends using a shorter cycle length to reduce the delay for pedestrians. A 100-second cycle length provides a sufficient amount of time for vehicles to progress through the network, without increasing delay for pedestrians.

## *Phase 1 Synchro Analysis*

**Table 8** through **Table 10** show the results of the Phase 1 Synchro analysis. Phase 1 Operations Schedules can be found in **Appendix D**.

Table 8. Phase 1 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Pearl Street/Atlantic Avenue</b>	<b>A</b>	<b>3.4</b>		
Atlantic WB left/thru   thru   thru	A	3.4	0.48	81
<b>Pearl Street/Purchase Street</b>	<b>B</b>	<b>12.3</b>		
Pearl WB left	C	34.1	0.31	53
Pearl WB left/thru   thru	D	37.6	0.63	132
Purchase SB thru   thru   thru/right	A	5.7	0.47	m78
<b>Seaport Boulevard/Atlantic Avenue</b>	<b>C</b>	<b>33.4</b>		
Seaport EB left/thru   thru	D	35.1	0.91	m183
Seaport WB thru/bear right	D	50.6	0.81	184
Seaport WB bear right/right	D	36.4	0.50	m139
Seaport WB right	B	12.5	0.68	142
Atlantic NB left/bear left	D	42.4	0.88	#453
Atlantic NB left/thru   thru/right	C	31.3	0.89	#238
<b>Oliver Street/Purchase Street</b>	<b>E</b>	<b>61.5</b>		
Oliver WB left/thru   thru	D	49.6	0.95	m#192
Purchase SB thru   thru   thru/right	D	43.5	0.93	#275
I-93 SWB left	F	91.8	0.97	#972
I-93 SWB thru   right	D	41.7	0.83	#461
<b>High Street/Atlantic Avenue</b>	<b>B</b>	<b>12.4</b>		
High EB left   left	D	48.2	0.35	57
Atlantic NB thru   thru	A	5.9	0.43	m87
<b>High Street/Purchase Street</b>	<b>A</b>	<b>5.4</b>		
High EB thru   thru/right	B	12.5	0.45	47
Purchase SB left/thru   thru   thru	A	3.8	0.43	58
<b>Broad Street/Purchase Street</b>	<b>A</b>	<b>2.3</b>		
Broad EB right	A	0.7	0.16	0
Purchase SB thru   thru   thru/right	A	2.4	0.41	71
<b>East India Row/Atlantic Avenue</b>	<b>A</b>	<b>8.8</b>		
East India WB thru/right	C	22.3	0.22	41
Atlantic NB left/thru   thru/right	A	8.0	0.38	361
<b>India Street/SASB</b>	<b>A</b>	<b>7.4</b>		
India WB left   left	D	37.9	0.42	94
India WB thru	D	37.3	0.33	82
SASB SB thru   thru   thru/right	A	0.9	0.34	18
<b>Milk Street/Atlantic Avenue</b>	<b>C</b>	<b>20.3</b>		
Milk EB left   left	C	32.7	0.18	41
Milk EB thru	D	52.6	0.68	158
Milk WB right	A	0.1	0.03	0
Atlantic NB thru   thru/right	A	9.2	0.47	70
<b>Milk Street/SASB</b>	<b>A</b>	<b>5.8</b>		
Milk EB thru   thru/right	C	28.7	0.31	60
SASB SB left/thru   thru   thru	A	3.3	0.50	34

Table 8. (cont.) Phase 1 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/Atlantic Avenue</b>	<b>A</b>	<b>3.6</b>		
State WB thru/right	C	25.1	0.28	40
Atlantic NB left/thru   thru   thru/right	A	1.6	0.25	10
<b>State Street/SASB</b>	<b>B</b>	<b>10.4</b>		
State WB left	C	30.1	0.30	43
State WB thru   thru	C	32.3	0.50	80
SASB SB thru   thru   thru/right	A	7.4	0.72	244
<b>Mercantile Street/Atlantic Avenue/Cross Street</b>	<b>B</b>	<b>19.5</b>		
Mercantile EB left/thru   thru	C	27.1	0.37	76
Atlantic WB thru   thru/right	D	41.9	0.56	134
Atlantic NB left/thru   thru	A	5.8	0.17	28
Atlantic NB right	A	1.5	0.27	0
<b>Mercantile Street/SASB</b>	<b>A</b>	<b>5.4</b>		
Mercantile WB left   left	C	25.3	0.66	141
SASB SB left/thru   thru   thru	A	1.9	0.54	m16
<b>Commercial Street/Cross Street</b>	<b>A</b>	<b>1.5</b>		
Commercial WB right	A	0.6	0.13	0
Cross NB thru   thru	A	1.6	0.16	9
<b>Clinton Street/SASB</b>	<b>D</b>	<b>45.0</b>		
I-93 WB left	D	54.1	0.93	#571
I-93 WB left/thru	D	54.8	0.95	#624
SASB SB thru   thru   thru/right	D	35.3	0.88	#331
<b>Kneeland Street/SASB</b>	<b>C</b>	<b>22.4</b>		
Kneeland EB thru   thru	C	29.2	0.43	132
Kneeland EB right	A	5.7	0.31	43
Kneeland WB left	C	24.6	0.41	m68
Kneeland WB thru   thru	D	35.2	0.72	m213
SASB SB left/thru   thru   thru/right	A	6.7	0.45	57
<b>Beach Street/SASB</b>	<b>A</b>	<b>3.8</b>		
Beach WB left	C	31.1	0.37	m55
SASB SB thru   thru   thru	A	1.5	0.28	20
<b>Essex Street/Lincoln Street/SASB</b>	<b>C</b>	<b>34.2</b>		
Essex EB left/thru   thru	C	39.0	0.76	256
Essex EB right/hard right	C	33.6	0.42	117
SASB SB left/thru   thru   thru/right	C	23.4	0.52	215
I-93 Ramp NWB left/thru   thru   thru/right	D	41.5	0.78	214
<b>Essex Street/South Street</b>	<b>A</b>	<b>5.2</b>		
Essex EB thru   thru/right	A	2.9	0.29	24
South WB left   left	C	22.2	0.18	m13
<b>Summer Street/Purchase Street/SASB</b>	<b>D</b>	<b>45.7</b>		
Summer EB thru	E	64.1	0.40	96
Summer EB right	D	38.6	0.24	42
Summer WB left	D	36.7	0.69	m198
Summer WB left/thru   thru	D	41.3	0.79	m230
Purchase SB left/thru   thru/right	D	52.6	0.95	#281
I-90 off-ramp SWB left/thru   thru/right	D	46.6	0.79	#304

Table 8. (cont.) Phase 1 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/Purchase Street</b>	<b>B</b>	<b>17.7</b>		
Congress EB thru   thru   thru/right	A	9.6	0.40	91
Congress EB right	B	11.9	0.33	102
Purchase SB hard left	C	25.6	0.75	314
Purchase SB left/thru   thru	C	21.5	0.76	271
<b>Kneeland Street/Lincoln Street</b>	<b>C</b>	<b>31.0</b>		
Kneeland EB left/thru   thru/right	C	26.9	0.74	115
Kneeland WB left/thru   thru   thru/right	D	53.0	0.86	m211
Lincoln NB left/thru   thru	C	20.8	0.60	#393
Lincoln NB right	A	3.0	0.33	38
<b>North Street/SASB</b>	<b>B</b>	<b>13.8</b>		
North Street EB right	A	0.5	0.05	m3
I-93 WB left/thru   thru	A	9.2	0.57	287
SASB SB thru   thru/right	C	27.0	0.75	192
<b>North Street/Cross Street</b>	<b>C</b>	<b>25.2</b>		
I-93 EB left	B	16.2	0.39	202
I-93 EB left/thru	B	16.5	0.42	204
Cross NB thru   thru/right	D	36.8	0.79	190
<b>Hanover Street/SASB</b>	<b>B</b>	<b>17.4</b>		
Hanover EB thru   thru/right	C	20.8	0.03	6
Hanover WB left	A	9.4	0.12	38
Hanover WB thru	B	11.0	0.21	91
SASB SB left/thru   thru/right	C	21.1	0.44	85
<b>Hanover Street/Cross Street</b>	<b>A</b>	<b>7.1</b>		
Hanover EB left	D	45.7	0.13	15
Hanover EB thru	D	45.1	0.10	m28
Hanover WB thru/right	C	30.3	0.61	79
Cross NB left/thru   thru/right	A	1.8	0.42	15
<b>New Sudbury Street/SASB</b>	<b>C</b>	<b>21.5</b>		
New Sudbury EB thru   thru	C	28.6	0.26	m64
New Sudbury EB right	A	8.8	0.34	m26
SASB SB left/thru   thru	B	11.1	0.30	58
Haymarket Station SEB right	E	65.7	0.72	25
<b>New Sudbury Street/Cross Street</b>	<b>B</b>	<b>14.5</b>		
New Sudbury EB left   left	A	2.2	0.17	5
Cross NB left/thru   thru	B	19.4	0.75	222
<b>New Chardon Street/SASB</b>	<b>D</b>	<b>37.0</b>		
New Chardon EB bear right   bear right	C	26.2	0.48	132
New Chardon EB right	B	23.3	0.21	45
SASB SB left	E	47.6	0.83	381
SASB SB left/thru   thru/right	D	35.7	0.82	361
SASB SB right	E	53.1	0.85	#440
I-93 NWB left   left	C	28.8	0.54	193

Table 8. (cont.) Phase 1 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>North Washington Street/Cross Street</b>	<b>B</b>	<b>11.3</b>		
Cooper Street WB right	A	1.0	0.16	0
I-93 NB thru   thru	D	47.8	0.56	83
Cross NWB bear right   bear right	A	1.8	0.43	25
<b>North Washington Street/Beverly Street</b>	<b>A</b>	<b>6.8</b>		
N. Washington SB thru   thru   thru	A	7.5	0.52	117
Beverly SEB right   right   right	A	3.5	0.18	m9
<b>Valenti Way/Beverly Street</b>				
Valenti WB left	A	0.5	0.19	17
<b>Valenti Way/North Washington Street</b>	<b>B</b>	<b>18.6</b>		
N. Washington NB left (de facto)	E	56.5	0.83	217
N. Washington NB thru/right	B	14.8	0.74	595
N. Washington SB left/thru   thru   thru/right	B	12.4	0.65	266
<b>Congress Street/Atlantic Avenue</b>	<b>C</b>	<b>21.5</b>		
Congress EB left   left	D	45.8	0.65	m126
Congress EB thru   thru	B	16.3	0.31	160
Congress WB right   right	A	4.9	0.31	m24
Atlantic NB thru   thru   thru/right	C	20.9	0.78	m125
<b>Summer Street/Atlantic Avenue</b>	<b>D</b>	<b>39.8</b>		
Summer EB left/thru   thru	D	36.6	0.70	m175
Summer WB thru   thru   thru/right	E	63.3	0.69	m144
Atlantic NB left/thru   thru   thru	C	29.3	0.90	m151
Atlantic NB right	D	50.0	0.96	m166
<b>Essex Street/Atlantic Avenue</b>	<b>D</b>	<b>45.1</b>		
Essex EB left   left	B	16.1	0.37	56
Atlantic NB left/thru   thru   thru	D	50.1	1.00	#510
<b>Beach Street/Atlantic Avenue</b>	<b>A</b>	<b>7.3</b>		
Atlantic NB left/thru   thru   thru	A	7.3	0.57	m140
<b>Kneeland Street/Atlantic Avenue/I-90 WB Off-Ramps</b>	<b>D</b>	<b>50.0</b>		
Kneeland EB left	E	76.0	0.89	m#258
Kneeland EB left/thru	E	63.4	0.81	m#238
MBTA Drive WB thru/right	D	39.0	0.05	18
Frontage NB left	D	42.5	0.55	#262
Frontage NB left/thru	D	47.9	0.70	#385
I-90 WB Off-Ramp NWB left	D	53.3	0.91	#497
I-90 WB Off-Ramp NWB thru	D	41.4	0.97	#969
<b>North Street/Clinton Street</b>	<b>B</b>	<b>19.0</b>		
North EB thru	C	25.5	0.15	61
North WB thru   thru	B	10.6	0.50	95
Clinton NB left   left/right	C	34.7	0.77	m103
<b>Purchase Street/Fire Station</b>				
Fire Station EB right	A	9.3	0.04	3
Purchase SB thru   thru   thru/right	A	0.0	0.29	0

Table 8. (cont.) Phase 1 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/Congress Street</b>	<b>C</b>	<b>27.4</b>		
State WB left/thru   thru/right	D	40.9	0.85	268
Congress NB thru   thru	B	12.6	0.21	41
Congress SB thru   thru/bear right	B	19.0	0.83	273
Congress SB right	C	26.5	0.81	#412
<b>North Street/Congress Street</b>	<b>D</b>	<b>51.7</b>		
North WB left   left/right	E	66.1	1.09	m#511
Congress NB thru   thru   thru/right	A	3.9	0.39	m4
Congress SB left/thru   thru   thru	D	53.5	0.95	#154
<b>North Street/Union Street</b>	<b>C</b>	<b>30.5</b>		
North EB left/thru   thru	A	0.5	0.05	m0
North WB thru   thru/right	C	33.1	0.87	#433
<b>Hanover Street/Congress Street</b>	<b>A</b>	<b>3.7</b>		
Hanover WB left	B	14.9	0.66	52
Congress NB thru   thru   thru/right	A	0.3	0.26	m0
Congress SB thru   thru   thru	A	1.9	0.23	13
<b>New Sudbury Street/Congress Street/Merrimac Street</b>	<b>C</b>	<b>31.5</b>		
New Sudbury EB left	D	50.5	0.67	161
New Sudbury EB thru   thru	D	37.7	0.41	103
New Sudbury EB right	A	9.5	0.43	52
Congress NB thru   thru   thru/right	C	33.2	0.81	281
Merrimac SB left	D	48.5	0.69	m60
Merrimac SB thru   thru   thru	C	20.1	0.23	m65
<b>New Chardon Street/Merrimac Street</b>	<b>F</b>	<b>102.5</b>		
New Chardon EB left/thru   thru/right	A	6.7	0.40	5
New Chardon WB hard left/left	F	513.5	2.05	#403
New Chardon WB thru   thru/right	C	25.3	0.47	194
Merrimac NB hard left/left	F	92.8	1.12	m#543
Merrimac NB thru   thru/right	B	18.3	0.70	83
Merrimac SB left/thru   thru   thru/right	D	46.8	0.76	102
<b>Summer Street/Dorchester Avenue</b>	<b>E</b>	<b>67.2</b>		
Summer EB left/thru   thru/right	E	64.7	1.02	m#465
Summer WB left/thru   thru/right	B	16.3	0.69	142
Dorchester NB left/thru/right	C	29.7	0.39	66
Dorchester SB left	F	229.6	1.38	#448
Dorchester SB thru/right	B	19.4	0.26	37
<b>Summer Street/Melcher Street</b>	<b>B</b>	<b>16.2</b>		
Summer EB thru   thru/right	A	6.1	0.63	m130
Summer WB left/thru   thru	C	25.6	0.59	235
Melcher NB left/right	D	54.2	0.68	160
<b>Summer Street/Pump House Road</b>	<b>A</b>	<b>9.3</b>		
Summer EB left/thru   thru	A	6.5	0.29	121
Summer WB thru   thru   thru/right	A	8.7	0.37	187
Driveway NB left/thru/right	A	0.0	0.0	0
Pump House SB left	D	37.8	0.27	41
Pump House SB left/right	C	25.3	0.28	34

Table 8. (cont.) Phase 1 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Massport Haul Road/Pump Station Connector</b>	<b>C</b>	<b>22.2</b>		
Haul EB thru	B	16.0	0.11	78
Haul EB right	A	5.3	0.12	28
Haul WB left	B	10.3	0.03	16
Haul WB thru	A	9.8	0.08	32
Pump Station NB left   left/right	C	31.8	0.57	48
<b>Summer Street/D Street</b>	<b>C</b>	<b>28.8</b>		
Summer EB left	C	25.4	0.35	97
Summer EB thru   thru/right	C	19.5	0.33	140
Summer WB left/thru   thru	D	32.5	0.69	#85
Summer WB right	A	8.9	0.44	32
D Street NB left	D	38.2	0.36	84
D Street NB thru   thru/right	C	31.2	0.33	81
D Street SB left	C	29.9	0.57	120
D Street SB thru   thru/right	B	16.7	0.47	95
<b>Ramp DB (I-90 WB On Ramp)/D Street</b>	<b>B</b>	<b>12.4</b>		
D Street NB left	D	51.3	0.67	176
D Street NB thru   thru	A	1.2	0.18	71
D Street SB thru   thru/right	A	8.5	0.27	154
<b>Transitway/D Street</b>	<b>B</b>	<b>10.0</b>		
Transitway EB thru	D	51.7	0.39	44
Transitway WB thru	D	49.8	0.35	47
D Street NB thru   thru   thru/right	B	10.8	0.22	60
D Street SB thru   thru	A	3.7	0.23	107
<b>Congress Street/D Street</b>	<b>C</b>	<b>31.8</b>		
Congress EB left/thru   thru/right	C	30.4	0.44	m183
Congress EB right	B	14.5	0.51	m154
Congress WB left/thru   thru/right	D	36.7	0.44	37
D Street NB left	D	44.8	0.74	205
D Street NB left/thru   thru/right	C	33.1	0.66	34
D Street SB left/thru   thru/right	D	42.5	0.56	96
<b>Congress Street/B Street/Ramps D&amp;F</b>	<b>D</b>	<b>36.8</b>		
Congress EB left/thru   thru	D	51.8	0.88	m#278
Congress EB right	B	12.4	0.12	m7
Congress WB left	D	35.5	0.41	m159
Congress WB left/thru   thru/right	C	31.7	0.40	127
Ramp NB left	E	69.5	0.90	#329
Ramp NB thru	C	29.0	0.54	206
Ramp NB right	A	5.4	0.56	61
B Street SB thru   thru	D	39.1	0.16	13
B Street SB right	B	19.8	0.12	m7



Table 8. (cont.) Phase 1 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/East Service Road/Ramps I&amp;C</b>	<b>C</b>	<b>30.6</b>		
Congress EB left	C	22.2	0.18	28
Congress EB thru   thru	B	17.9	0.16	52
Congress WB thru   thru	C	27.6	0.30	m111
Congress WB right	B	17.5	0.14	m33
Ramp I NB left/thru   thru	D	41.6	0.67	168
Ramp I NB right	A	8.2	0.54	43
Ramp C NEB thru   thru/right	D	36.9	0.83	292
<b>Congress Street/Boston Wharf Road</b>	<b>C</b>	<b>22.5</b>		
Congress EB left/thru	C	23.6	0.50	m203
Congress EB right	A	6.5	0.09	m8
Congress WB left	B	13.6	0.06	m10
Congress WB thru   thru/right	B	13.1	0.30	M90
Boston Wharf NB left	D	46.1	0.60	156
Boston Wharf NB thru/right	C	29.9	0.23	49
Boston Wharf SB left/thru	D	46.4	0.49	47
Boston Wharf SB right	B	11.4	0.36	27
<b>Seaport Boulevard (Northern Avenue)/ B Street</b>	<b>C</b>	<b>21.9</b>		
Seaport EB thru   thru/right	B	13.1	0.66	136
Seaport WB left/thru   thru	B	16.2	0.43	146
B Street NB left   left	E	59.6	0.71	m119
B Street NB right	B	19.6	0.49	m53
<b>Seaport Boulevard/Northern Avenue/East Service Road</b>	<b>B</b>	<b>15.6</b>		
Seaport EB left	A	9.0	0.21	6
Seaport EB thru   thru	A	9.2	0.46	36
Seaport WB thru   thru/right	B	6.9	0.60	257
East Service NB left	C	30.4	0.53	m152
East Service NB thru	D	35.1	0.70	m192
East Service NB right	B	12.0	0.57	m105
Northern SB left	D	45.2	0.26	38
Northern SB left/right	C	29.9	0.24	41
<b>Seaport Boulevard/Sleeper Street</b>	<b>B</b>	<b>18.2</b>		
Seaport EB left/thru   thru	C	26.6	3.75dl	m#471
Seaport EB right	A	0.2	0.16	m0
Seaport WB left	A	1.7	0.08	m4
Seaport WB thru   thru/right	A	2.5	0.28	37
Sleeper NB left/thru/right	D	43.4	0.66	75
Sleeper SB left/thru	D	36.8	0.21	26
Sleeper SB right	B	12.6	0.17	22
<b>Congress Street/Dorchester Avenue</b>	<b>B</b>	<b>17.6</b>		
Congress EB thru	B	16.6	0.46	m169
Congress EB right	A	7.0	0.49	m67
Congress WB left/thru	C	23.3	0.38	m150
Dorchester NB left/right	C	27.5	0.78	m197

Table 8. (cont.) Phase 1 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/A Street</b>	<b>D</b>	<b>45.4</b>		
Congress EB left/thru   thru	E	60.2	0.89	m#347
Congress EB right	A	5.0	0.19	m49
Congress WB left	D	46.8	0.87	#379
Congress WB thru/right	B	19.2	0.25	196
A Street NB left/thru/right	E	71.4	0.93	109
Thompson SB left/thru/right	C	29.9	0.15	5
<b>Summer Street/West Side Drive</b>	<b>A</b>	<b>5.6</b>		
Summer EB thru   thru/right	A	1.7	0.35	78
Summer WB left	B	10.7	0.09	14
Summer WB thru   thru	B	9.3	0.24	87
West Side NB left	D	40.2	0.02	13
West Side NB right	C	23.2	0.05	6
<b>Summer Street/WTC Avenue</b>	<b>B</b>	<b>11.3</b>		
Summer EB left	A	6.6	0.04	5
Summer EB thru   thru	A	7.9	0.31	42
Summer EB right	A	1.2	0.08	3
Summer WB left	A	9.4	0.15	m25
Summer WB thru   thru/right	B	12.6	0.31	m103
WTC NB left	D	43.4	0.18	40
WTC NB thru/right	B	17.7	0.19	9
WTC SB left	D	45.2	0.22	36
WTC SB thru/right	A	0.0	0.02	0
<b>Seaport Boulevard/Boston Wharf Road</b>	<b>A</b>	<b>7.5</b>		
Seaport EB thru   thru/right	A	4.6	0.50	m105
Seaport WB left	A	7.8	0.14	m29
Seaport WB thru  thru	A	6.0	0.26	165
Boston Wharf NB left   left/right	D	51.1	0.30	33
<b>SSCONN/Albany Street</b>	<b>A</b>	<b>8.7</b>		
SSCONN WB left   left	E	46.2	0.34	38
Albany SB left/thru   thru   thru	A	3.9	0.20	84
<b>Broadway Bridge/Frontage Road</b>	<b>E</b>	<b>62.9</b>		
Traveler EB hard left	D	41.2	0.15	m47
Traveler EB left	F	93.7	0.60	140
Traveler EB thru   thru	A	8.1	0.31	42
Broadway WB right	C	32.9	0.65	323
Broadway WB hard right (de facto)	F	133.5	1.19	#853
Frontage NB thru   thru	C	35.0	0.26	m110
Frontage NB right   right   right/hard right	E	56.0	0.94	#254
<b>Bennington Street/Neptune Road</b>	<b>E</b>	<b>57.5</b>		
Bennington EB left/thru   thru/right	E	60.5	0.70	102
Bennington WB left/thru   thru/right	E	72.0	0.89	m#95
Neptune NB left/thru   thru/right	D	50.8	0.91	#264
Neptune SB left (de facto)	F	85.0	1.10	#899
Neptune SB thru/right	B	14.6	0.53	445

Table 8. (cont.) Phase 1 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>SSECONN/Ramps K&amp;X</b>	<b>B</b>	<b>10.1</b>		
SSECONN EB left/thru	E	57.6	0.32	42
SSECONN EB right	C	21.0	0.10	8
SSECONN WB left	D	50.5	0.28	33
SSECONN WB thru/right	C	30.0	0.39	36
Ramp NB left/thru   thru/right	A	7.1	0.45	265
Ramp SB left	A	6.2	0.06	m4
Ramp SB left/thru   thru/right	A	2.8	0.04	m5
<b>East Berkeley Street/Albany Street</b>	<b>D</b>	<b>36.2</b>		
East Berkeley WB left/thru   thru   thru	D	44.5	0.65	209
Albany SB thru   thru   thru/right	C	20.6	0.47	70
<b>West 4<sup>th</sup> Street/Frontage Road</b>	<b>C</b>	<b>32.7</b>		
West 4 <sup>th</sup> WB thru   thru   thru/right	D	52.0	0.87	355
Frontage NB left	C	22.0	0.64	#646
Frontage NB thru   thru/right	B	17.4	0.64	#534
<b>Traveler Street/Albany Street</b>	<b>B</b>	<b>14.2</b>		
Traveler EB thru/right	E	58.3	0.69	188
Albany SB left	B	10.6	0.51	383
Albany SB left/thru   thru/right	A	8.7	0.51	372
<b>Herald Street/Albany Street</b>	<b>C</b>	<b>22.7</b>		
Herald EB right   right   right	B	13.6	0.53	184
Albany SB thru   thru   thru	C	29.2	0.83	224
<b>MBTA Bus Lot (near Randolph)/Albany Street</b>	<b>D</b>	<b>37.6</b>		
MBTA EB thru/right	D	39.4	0.06	12
Albany SB left	C	26.6	0.19	m101
Albany SB left/bear left   bear left	C	24.0	0.19	87
Albany SB thru/right	A	4.1	0.53	112
Albany NB right   right	F	80.6	0.62	255
<b>Ramp A2/Ramp I/Frontage Road</b>	<b>C</b>	<b>27.1</b>		
Frontage SB thru	C	34.3	0.53	211
Frontage SB right	C	28.1	0.13	60
Ramp SWB left/thru   thru	C	25.9	0.91	470
<b>Nashua Street/Martha Road</b>	<b>A</b>	<b>8.8</b>		
Nashua WB left   left	A	8.6	0.43	54
Martha SB thru   thru	A	8.9	0.48	105
<b>Chelsea Street/Rutherford Avenue/N. Washington Street</b>	<b>C</b>	<b>34.4</b>		
Chelsea WB left	F	140.3	1.20	#683
Chelsea WB thru	D	35.2	0.69	319
Chelsea WB right	A	5.0	0.31	33
N. Washington NB thru   thru   thru	C	30.0	0.33	90
N. Washington NB right	A	9.0	0.73	104
Rutherford SB left	E	71.4	0.94	m#353
Rutherford SB thru   thru   thru	A	4.5	0.55	80
Rutherford SB right	A	4.4	0.64	m62

Table 8. (cont.) Phase 1 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>LT-TL/Rutherford Avenue</b>	<b>C</b>	<b>28.5</b>		
Ramp EB left   left	D	35.2	0.59	174
Ramp EB right   right	D	47.8	0.84	239
Rutherford NB left	C	31.5	0.73	m#236
Rutherford NB thru   thru   thru   thru	A	4.6	0.11	m22
Rutherford SB thru   thru   thru   thru	C	29.4	0.77	348
Rutherford SB right	A	6.1	0.26	91
<b>Albany Street/Frontage Road</b>	<b>C</b>	<b>22.8</b>		
Albany EB left   left	C	26.7	0.73	90
Albany EB thru	B	18.1	0.07	m13
Albany WB right	C	23.5	0.48	46
Frontage NB thru   thru   thru/right	C	21.0	0.56	341
<b>Neptune Road/Route 1A Off-ramp</b>	<b>D</b>	<b>35.3</b>		
Neptune EB left/thru   thru	A	4.4	0.06	m11
Neptune WB thru   thru/right	B	13.3	0.24	47
Off-Ramp NB left	E	65.9	0.87	259
Off-Ramp NB thru/right	C	33.2	0.36	99

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

m = 95th percentile queue is metered by upstream traffic signal.

\* 25-foot left-turn pocket added during calibration process.

Table 9. Phase 1 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Pearl Street/Atlantic Avenue</b>	<b>A</b>	<b>6.4</b>		
Atlantic WB left/thru   thru   thru	A	6.4	0.37	103
<b>Pearl Street/Purchase Street</b>	<b>A</b>	<b>8.8</b>		
Pearl WB left	D	44.3	0.26	60
Pearl WB left/thru   thru	D	44.0	0.35	58
Purchase SB thru   thru   thru/right	A	4.2	0.42	71
<b>Seaport Boulevard/Atlantic Avenue</b>	<b>C</b>	<b>24.1</b>		
Seaport EB left/thru   thru	C	20.6	0.62	58
Seaport WB thru/bear right	E	58.7	0.76	196
Seaport WB bear right/right	E	56.8	0.72	145
Seaport WB right	B	17.6	0.54	54
Atlantic NB left/bear left	B	19.7	0.66	#394
Atlantic NB left/thru   thru/right	B	14.1	0.66	#330
<b>Oliver Street/Purchase Street</b>	<b>C</b>	<b>27.0</b>		
Oliver WB left/thru   thru	D	42.3	0.73	m128
Purchase SB thru   thru   thru/right	C	26.6	0.80	231
I-93 SWB left	B	12.3	0.45	197
I-93 SWB thru   right	C	34.9	0.54	184
<b>High Street/Atlantic Avenue</b>	<b>B</b>	<b>16.6</b>		
High EB left   left	D	43.2	0.39	55
Atlantic NB thru   thru	A	9.3	0.38	114
<b>High Street/Purchase Street</b>	<b>A</b>	<b>8.6</b>		
High EB thru   thru/right	C	23.6	0.41	43
Purchase SB left/thru   thru   thru	A	4.4	0.36	21
<b>Broad Street/Purchase Street</b>	<b>A</b>	<b>3.5</b>		
Broad EB right	A	1.2	0.28	0
Purchase SB thru   thru   thru/right	A	4.0	0.29	33
<b>East India Row/Atlantic Avenue</b>	<b>A</b>	<b>6.4</b>		
East India WB thru/right	B	19.5	0.25	35
Atlantic NB left/thru   thru/right	A	5.4	0.30	63
<b>India Street/SASB</b>	<b>A</b>	<b>6.5</b>		
India WB left   left	C	28.1	0.24	48
India WB thru	C	28.1	0.21	62
SASB SB thru   thru   thru/right	A	1.7	0.23	32
<b>Milk Street/Atlantic Avenue</b>	<b>B</b>	<b>13.7</b>		
Milk EB left   left	C	30.3	0.33	53
Milk EB thru	D	38.5	0.42	87
Milk WB right	A	0.1	0.04	0
Atlantic NB thru   thru/right	A	7.5	0.47	11
<b>Milk Street/SASB</b>	<b>A</b>	<b>7.0</b>		
Milk EB thru   thru/right	B	19.9	0.36	46
SASB SB left/thru   thru   thru	A	3.5	0.32	31

Table 9. (cont.) Phase 1 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/Atlantic Avenue</b>	<b>A</b>	<b>3.4</b>		
State WB thru/right	C	22.1	0.23	47
Atlantic NB left/thru   thru   thru/right	A	1.6	0.32	20
<b>State Street/SASB</b>	<b>A</b>	<b>9.6</b>		
State WB left	C	28.8	0.31	51
State WB thru   thru	C	27.8	0.40	67
SASB SB thru   thru   thru/right	A	5.0	0.43	108
<b>Mercantile Street/Atlantic Avenue/Cross Street</b>	<b>B</b>	<b>16.1</b>		
Mercantile EB left/thru   thru	C	32.6	0.34	80
Atlantic WB thru   thru/right	C	31.0	0.43	91
Atlantic NB left/thru   thru	A	6.1	0.23	43
Atlantic NB right	A	4.0	0.35	0
<b>Mercantile Street/SASB</b>	<b>A</b>	<b>3.4</b>		
Mercantile WB left   left	B	15.9	0.49	18
SASB SB left/thru   thru   thru	A	0.5	0.28	0
<b>Commercial Street/Cross Street</b>	<b>A</b>	<b>3.6</b>		
Commercial WB right	A	0.4	0.09	0
Cross NB thru   thru	A	3.9	0.16	35
<b>Clinton Street/SASB</b>	<b>C</b>	<b>25.3</b>		
I-93 WB left	D	42.3	0.69	167
I-93 WB left/thru	D	41.9	0.70	203
SASB SB thru   thru   thru/right	B	12.9	0.56	124
<b>Kneeland Street/SASB</b>	<b>C</b>	<b>23.3</b>		
Kneeland EB thru   thru	D	43.4	0.79	180
Kneeland EB right	A	7.8	0.46	51
Kneeland WB left	C	33.9	0.47	m78
Kneeland WB thru   thru	D	35.3	0.56	195
SASB SB left/thru   thru   thru/right	A	8.2	0.49	19
<b>Beach Street/SASB</b>	<b>A</b>	<b>8.1</b>		
Beach WB left	D	49.7	0.55	89
SASB SB thru   thru   thru	A	2.1	0.29	36
<b>Essex Street/Lincoln Street/SASB</b>	<b>C</b>	<b>23.7</b>		
Essex EB left/thru   thru	C	28.4	0.75	96
Essex EB right/hard right	C	21.9	0.71	50
SASB SB left/thru   thru   thru/right	B	15.4	0.49	142
I-93 Ramp NWB left/thru   thru   thru/right	C	33.8	0.58	112
<b>Essex Street/South Street</b>	<b>A</b>	<b>5.2</b>		
Essex EB thru   thru/right	A	4.1	0.28	21
South WB left   left	B	14.7	0.13	m17
<b>Summer Street/Purchase Street/SASB</b>	<b>D</b>	<b>39.9</b>		
Summer EB thru	D	51.0	0.28	85
Summer EB right	C	34.8	0.24	21
Summer WB left	C	32.8	0.71	m81
Summer WB left/thru   thru	C	24.7	0.71	m78
Purchase SB left/thru   thru/right	D	53.8	0.84	#260
I-90 off-ramp SWB left/thru   thru/right	C	31.4	0.39	112

Table 9. (cont.) Phase 1 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/Purchase Street</b>	<b>B</b>	<b>15.8</b>		
Congress EB thru   thru   thru/right	B	16.3	0.41	146
Congress EB right	B	19.9	0.41	168
Purchase SB hard left	B	13.3	0.55	49
Purchase SB left/thru   thru	B	15.5	0.77	58
<b>Kneeland Street/Lincoln Street</b>	<b>C</b>	<b>23.9</b>		
Kneeland EB left/thru   thru/right	C	26.2	0.77	m118
Kneeland WB left/thru   thru   thru/right	C	25.5	0.66	132
Lincoln NB left/thru   thru	C	23.9	0.36	194
Lincoln NB right	B	11.0	0.25	96
<b>North Street/SASB</b>	<b>B</b>	<b>12.1</b>		
North Street EB right	A	1.6	0.20	1
I-93 WB left/thru   thru	A	5.3	0.29	97
SASB SB thru   thru/right	C	29.9	0.63	154
<b>North Street/Cross Street</b>	<b>C</b>	<b>24.1</b>		
I-93 EB left	B	14.5	0.26	118
I-93 EB left/thru	B	14.6	0.27	87
Cross NB thru   thru/right	C	32.0	0.80	172
<b>Hanover Street/SASB</b>	<b>A</b>	<b>9.1</b>		
Hanover EB thru   thru/right	B	18.1	0.08	12
Hanover WB left	B	15.5	0.18	m40
Hanover WB thru	B	15.9	0.22	64
SASB SB left/thru   thru/right	A	5.0	0.27	35
<b>Hanover Street/Cross Street</b>	<b>A</b>	<b>8.5</b>		
Hanover EB left	C	27.0	0.17	22
Hanover EB thru	C	28.0	0.24	30
Hanover WB thru/right	C	29.7	0.63	113
Cross NB left/thru   thru/right	A	1.6	0.37	7
<b>New Sudbury Street/SASB</b>	<b>C</b>	<b>23.2</b>		
New Sudbury EB thru   thru	B	12.0	0.15	76
New Sudbury EB right	A	5.9	0.31	54
SASB SB left/thru   thru	D	36.9	0.70	155
Haymarket Station SEB right	D	50.9	0.43	13
<b>New Sudbury Street/Cross Street</b>	<b>A</b>	<b>10.0</b>		
New Sudbury EB left   left	A	6.0	0.16	50
Cross NB left/thru   thru	B	12.5	0.67	130
<b>New Chardon Street/SASB</b>	<b>C</b>	<b>24.8</b>		
New Chardon EB bear right   bear right	C	22.1	0.47	184
New Chardon EB right	B	18.5	0.16	59
SASB SB left	C	29.9	0.64	238
SASB SB left/thru   thru/right	C	26.3	0.64	209
SASB SB right	C	31.0	0.65	235
I-93 NWB left   left	B	19.0	0.26	91

Table 9. (cont.) Phase 1 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>North Washington Street/Cross Street</b>	<b>A</b>	<b>9.7</b>		
Cooper Street WB right	A	0.9	0.18	0
I-93 NB thru   thru	D	40.9	0.41	51
Cross NWB bear right   bear right	A	3.9	0.40	31
<b>North Washington Street/Beverly Street</b>	<b>C</b>	<b>25.2</b>		
N. Washington SB thru   thru   thru	C	29.6	0.35	180
Beverly SEB right   right   right	B	13.2	0.16	m49
<b>Valenti Way/Beverly Street</b>	<b>A</b>	<b>7.8</b>		
Valenti WB left	A	0.5	0.18	16
<b>Valenti Way/North Washington Street</b>	<b>A</b>	<b>7.8</b>		
N. Washington NB left/thru   thru/right	A	2.1	0.54	0
N. Washington SB left/thru   thru   thru/right	B	13.1	0.71	212
<b>Congress Street/Atlantic Avenue</b>	<b>B</b>	<b>20.4</b>		
Congress EB left   left	D	52.3	0.68	135
Congress EB thru   thru	A	9.3	0.21	54
Congress WB right   right	A	0.6	0.24	m0
Atlantic NB thru   thru   thru/right	B	18.5	0.68	49
<b>Summer Street/Atlantic Avenue</b>	<b>C</b>	<b>23.1</b>		
Summer EB left/thru   thru	D	35.2	0.37	m115
Summer WB thru   thru   thru/right	C	20.4	0.49	87
Atlantic NB left/thru   thru   thru	B	19.8	0.72	107
Atlantic NB right	C	26.2	0.68	#119
<b>Essex Street/Atlantic Avenue</b>	<b>C</b>	<b>21.4</b>		
Essex EB left   left	C	14.5	0.29	52
Atlantic NB left/thru   thru   thru	B	23.3	0.60	234
<b>Beach Street/Atlantic Avenue</b>	<b>B</b>	<b>10.4</b>		
Atlantic NB left/thru   thru   thru	B	10.4	0.33	125
<b>Kneeland Street/Atlantic Avenue/I-90 WB Off-Ramps</b>	<b>C</b>	<b>31.9</b>		
Kneeland EB left	D	39.9	0.80	m167
Kneeland EB left/thru	C	33.0	0.73	m160
MBTA Drive WB thru/right	C	33.0	0.02	6
Frontage NB left	C	26.6	0.32	167
Frontage NB left/thru	C	27.3	0.36	182
I-90 WB Off-Ramp NWB left	E	56.8	0.82	168
I-90 WB Off-Ramp NWB thru	B	12.6	0.36	187
<b>North Street/Clinton Street</b>	<b>B</b>	<b>19.5</b>		
North EB thru	C	22.2	0.20	117
North WB thru   thru	B	11.5	0.37	89
Clinton NB left   left/right	C	32.8	0.69	110
<b>Purchase Street/Fire Station</b>	<b>A</b>	<b>0.5</b>		
Fire Station EB right	A	9.4	0.06	5
Purchase SB thru   thru   thru/right	A	0.0	0.23	0



Table 9. (cont.) Phase 1 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/Congress Street</b>	<b>B</b>	<b>19.1</b>		
State WB left/thru   thru/right	C	25.4	0.58	167
Congress NB thru   thru	C	22.8	0.25	80
Congress SB thru   thru/bear right	B	12.3	0.59	136
Congress SB right	B	15.3	0.57	143
<b>North Street/Congress Street</b>	<b>C</b>	<b>20.7</b>		
North WB left   left/right	C	21.0	0.82	137
Congress NB thru   thru   thru/right	A	2.7	0.38	4
Congress SB left/thru   thru   thru	D	35.7	0.75	100
<b>North Street/Union Street</b>	<b>B</b>	<b>12.1</b>		
North EB left/thru   thru	A	6.8	0.10	18
North WB thru   thru/right	B	13.4	0.57	103
<b>Hanover Street/Congress Street</b>	<b>A</b>	<b>1.4</b>		
Hanover WB left	A	2.2	0.33	5
Congress NB thru   thru   thru/right	A	0.3	0.21	m0
Congress SB thru   thru   thru	A	2.4	0.18	11
<b>New Sudbury Street/Congress Street/Merrimac Street</b>	<b>C</b>	<b>32.4</b>		
New Sudbury EB left	D	42.4	0.62	151
New Sudbury EB thru   thru	C	32.3	0.37	90
New Sudbury EB right	A	8.3	0.48	49
Congress NB thru   thru   thru/right	D	40.9	0.68	213
Merrimac SB left	E	55.3	0.55	m61
Merrimac SB thru   thru   thru	B	13.9	0.17	m45
<b>New Chardon Street/Merrimac Street</b>	<b>C</b>	<b>31.2</b>		
New Chardon EB left/thru   thru/right	A	4.5	0.37	6
New Chardon WB hard left/left	F	96.1	0.97	#118
New Chardon WB thru   thru/right	C	22.7	0.27	117
Merrimac NB hard left/left	D	51.6	0.97	#360
Merrimac NB thru   thru/right	B	12.8	0.57	58
Merrimac SB left/thru   thru   thru/right	C	32.1	0.58	94
<b>Summer Street/Dorchester Avenue</b>	<b>C</b>	<b>21.6</b>		
Summer EB left/thru   thru/right	B	18.3	0.65	#373
Summer WB left/thru   thru/right	B	10.1	0.48	122
Dorchester NB left/thru/right	C	28.1	0.46	83
Dorchester SB left	E	62.8	0.94	#217
Dorchester SB thru/right	A	4.8	0.31	9
<b>Summer Street/Melcher Street</b>	<b>B</b>	<b>15.4</b>		
Summer EB thru   thru/right	B	10.2	0.49	m169
Summer WB left/thru   thru	B	15.8	0.48	198
Melcher NB left/right	D	42.5	0.67	139
<b>Summer Street/Pump House Road</b>	<b>A</b>	<b>9.6</b>		
Summer EB left/thru   thru	A	6.8	0.27	122
Summer WB thru   thru   thru/right	A	8.8	0.23	97
Driveway NB left/thru/right	A	0.0	0.00	0
Pump House SB left	C	35.0	0.32	38
Pump House SB left/right	B	19.8	0.34	36

Table 9. (cont.) Phase 1 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Massport Haul Road/Pump Station Connector</b>	<b>B</b>	<b>12.1</b>		
Haul EB thru	B	13.7	0.08	51
Haul EB right	A	5.3	0.11	29
Haul WB left	A	7.6	0.06	14
Haul WB thru	A	7.5	0.07	38
Pump Station NB left   left/right	B	19.1	0.24	13
<b>Summer Street/D Street</b>	<b>C</b>	<b>23.1</b>		
Summer EB left	B	18.3	0.36	45
Summer EB thru   thru/right	B	13.0	0.28	45
Summer WB left/thru   thru	D	41.6	0.52	102
Summer WB right	B	12.5	0.31	65
D Street NB left	C	30.1	0.23	68
D Street NB thru   thru/right	B	17.1	0.25	51
D Street SB left	D	38.1	0.43	83
D Street SB thru   thru/right	C	24.7	0.43	63
<b>Ramp DB (I-90 WB On Ramp)/D Street</b>	<b>B</b>	<b>10.9</b>		
D Street NB left	D	37.2	0.54	141
D Street NB thru   thru	A	1.1	0.12	23
D Street SB thru   thru/right	A	8.8	0.25	124
<b>Transitway/D Street</b>	<b>A</b>	<b>6.7</b>		
Transitway EB thru	D	41.7	0.21	25
Transitway WB thru	D	40.4	0.21	29
D Street NB thru   thru   thru/right	A	7.9	0.13	38
D Street SB thru   thru	A	3.1	0.18	60
<b>Congress Street/D Street</b>	<b>C</b>	<b>20.9</b>		
Congress EB left/thru   thru/right	A	7.3	0.27	65
Congress EB right	A	3.1	0.32	91
Congress WB left/thru   thru/right	D	37.4	0.51	45
D Street NB left	C	30.7	0.60	65
D Street NB left/thru   thru/right	C	20.1	0.54	50
D Street SB left/thru   thru/right	D	36.4	0.51	84
<b>Congress Street/B Street/Ramps D&amp;F</b>	<b>C</b>	<b>30.0</b>		
Congress EB left/thru   thru	D	40.2	0.57	120
Congress EB right	B	13.2	0.30	4
Congress WB left	C	34.4	0.23	m135
Congress WB left/thru   thru/right	C	31.6	0.22	86
Ramp NB left	D	47.0	0.49	93
Ramp NB thru	C	26.4	0.17	59
Ramp NB right	A	7.3	0.47	55
B Street SB thru   thru	D	54.2	0.21	m32
B Street SB right	C	34.6	0.19	m22

Table 9. (cont.) Phase 1 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/East Service Road/Ramps I&amp;C</b>	<b>B</b>	<b>18.9</b>		
Congress EB left	A	5.1	0.04	7
Congress EB thru   thru	A	5.0	0.08	23
Congress WB thru   thru	B	10.9	0.09	45
Congress WB right	A	7.7	0.02	m5
Ramp I NB left/thru   thru	D	37.8	0.29	47
Ramp I NB right	B	12.5	0.45	23
Ramp C NEB thru   thru/right	D	37.5	0.35	60
<b>Congress Street/Boston Wharf Road</b>	<b>B</b>	<b>16.3</b>		
Congress EB left/thru	A	9.6	0.24	m59
Congress EB right	A	2.8	0.13	m8
Congress WB left	A	7.0	0.08	12
Congress WB thru   thru/right	A	5.2	0.12	25
Boston Wharf NB left	C	32.8	0.15	47
Boston Wharf NB thru/right	C	22.8	0.16	21
Boston Wharf SB left/thru	D	51.8	0.54	67
Boston Wharf SB right	C	21.6	0.30	43
<b>Seaport Boulevard (Northern Avenue)/ B Street</b>	<b>B</b>	<b>17.2</b>		
Seaport EB thru   thru/right	A	9.8	0.63	m131
Seaport WB left	C	27.2	0.51	55
Seaport WB thru	B	19.0	0.59	250
B Street NB left   left	D	45.5	0.52	84
B Street NB right	B	16.5	0.57	39
<b>Seaport Boulevard/Northern Avenue/East Service Road</b>	<b>C</b>	<b>26.6</b>		
Seaport EB left	C	23.6	0.51	#79
Seaport EB thru   thru	B	18.7	0.58	158
Seaport WB thru   thru/right	C	33.7	0.87	#321
East Service NB left	D	40.1	0.57	152
East Service NB thru	D	37.4	0.49	130
East Service NB right	B	11.9	0.59	44
Northern SB left	D	40.8	0.51	100
Northern SB left/right	B	15.7	0.44	75
<b>Seaport Boulevard/Sleeper Street</b>	<b>A</b>	<b>7.4</b>		
Seaport EB left/thru   thru	A	6.4	1.20dl	145
Seaport EB right	A	0.6	0.07	m1
Seaport WB left	A	2.7	0.08	7
Seaport WB thru   thru/right	A	3.1	0.22	33
Sleeper NB left/thru/right	C	31.7	0.42	16
Sleeper SB left/thru	D	38.1	0.22	31
Sleeper SB right	B	12.8	0.40	18
<b>Congress Street/Dorchester Avenue</b>	<b>B</b>	<b>14.0</b>		
Congress EB thru	A	6.4	0.30	65
Congress EB right	A	1.5	0.34	0
Congress WB left/thru	B	17.2	0.36	m196
Dorchester NB left/right	D	40.0	0.74	42

Table 9. (cont.) Phase 1 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/A Street</b>	<b>C</b>	<b>32.3</b>		
Congress EB left/thru   thru	E	69.0	0.92	#290
Congress EB right	A	4.9	0.17	m46
Congress WB left	B	16.3	0.46	81
Congress WB thru/right	A	9.3	0.16	69
A Street NB left/thru/right	D	38.0	0.76	23
Thompson SB left/thru/right	C	25.6	0.13	23
<b>Summer Street/West Side Drive</b>	<b>A</b>	<b>6.8</b>		
Summer EB thru   thru/right	A	6.5	0.26	99
Summer WB left	A	5.3	0.04	4
Summer WB thru   thru	A	4.0	0.13	23
West Side NB left	D	37.0	0.11	19
West Side NB right	B	14.0	0.23	6
<b>Summer Street/WTC Avenue</b>	<b>B</b>	<b>12.1</b>		
Summer EB left	A	6.7	0.06	12
Summer EB thru   thru	A	7.9	0.23	51
Summer EB right	A	1.9	0.06	5
Summer WB left	B	14.5	0.10	m35
Summer WB thru   thru/right	B	17.9	0.15	105
WTC NB left	D	41.4	0.25	23
WTC NB thru/right	A	0.1	0.06	0
WTC SB left	D	39.7	0.16	30
WTC SB thru/right	A	0.1	0.03	0
<b>Seaport Boulevard/Boston Wharf Road</b>	<b>A</b>	<b>7.6</b>		
Seaport EB thru   thru/right	A	8.0	0.37	138
Seaport WB left	A	4.8	0.22	25
Seaport WB thru   thru	A	3.9	0.14	m43
Boston Wharf NB left   left/right	C	20.9	0.35	29
<b>SSCONN/Albany Street</b>	<b>A</b>	<b>7.2</b>		
SSCONN WB left   left	D	47.0	0.25	m42
Albany SB left/thru   thru   thru	A	3.6	0.23	84
<b>Broadway Bridge/Frontage Road</b>	<b>D</b>	<b>36.6</b>		
Traveler EB hard left	D	41.9	0.16	m53
Traveler EB left	E	60.7	0.67	188
Traveler EB thru   thru	B	15.0	0.27	32
Broadway WB right	C	31.3	0.33	106
Broadway WB hard right (de facto)	E	79.3	0.99	#415
Frontage NB thru   thru	B	17.9	0.14	m43
Frontage NB right   right   right/hard right	C	21.9	0.56	m121
<b>Bennington Street/Neptune Road</b>	<b>C</b>	<b>26.4</b>		
Bennington EB left/thru   thru/right	D	39.2	0.41	55
Bennington WB left/thru   thru/right	C	28.8	0.76	m77
Neptune NB left/thru   thru/right	C	29.4	0.60	#288
Neptune SB left/thru   thru/right	B	19.3	0.58	#296

Table 9. (cont.) Phase 1 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>SSCONN/Ramps K&amp;X</b>	<b>B</b>	<b>10.8</b>		
SSCONN EB left/thru	D	40.7	0.12	15
SSCONN EB right	C	33.3	0.12	23
SSCONN WB left	D	42.8	0.25	26
SSCONN WB thru/right	C	24.1	0.52	23
Ramp NB left/thru   thru/right	A	7.3	0.38	143
Ramp SB left	B	17.5	0.04	m6
Ramp SB left/thru   thru/right	B	11.1	0.04	m20
<b>East Berkeley Street/Albany Street</b>	<b>B</b>	<b>17.5</b>		
East Berkeley WB left/thru   thru   thru	B	14.5	0.35	m57
Albany SB thru   thru   thru/right	C	21.2	0.35	134
<b>West 4<sup>th</sup> Street/Frontage Road</b>	<b>C</b>	<b>33.4</b>		
West 4 <sup>th</sup> WB thru   thru   thru/right	E	62.9	0.99	#356
Frontage NB left	B	13.9	0.62	#580
Frontage NB thru   thru/right	B	11.5	0.62	#476
<b>Traveler Street/Albany Street</b>	<b>B</b>	<b>11.6</b>		
Traveler EB thru/right	D	42.0	0.61	118
Albany SB left	A	8.4	0.37	250
Albany SB left/thru   thru/right	A	7.0	0.37	214
<b>Herald Street/Albany Street</b>	<b>C</b>	<b>21.3</b>		
Herald EB right   right   right	B	14.4	0.52	192
Albany SB thru   thru   thru	C	26.3	0.82	272
<b>MBTA Bus Lot (near Randolph)/Albany Street</b>	<b>D</b>	<b>42.7</b>		
MBTA EB thru/right	C	32.7	0.06	4
Albany SB left	C	26.1	0.25	81
Albany SB left/bear left   bear left	C	22.1	0.25	96
Albany SB thru/right	A	3.9	0.38	64
Albany NB right   right	F	95.0	0.53	172
<b>Ramp A2/Ramp I/Frontage Road</b>	<b>C</b>	<b>25.4</b>		
Frontage SB thru	C	32.2	0.55	191
Frontage SB right	C	25.7	0.13	54
Ramp SWB left/thru   thru	C	24.2	0.91	449
<b>Nashua Street/Martha Road</b>	<b>A</b>	<b>4.5</b>		
Nashua WB left   left	A	0.4	0.23	0
Martha SB thru   thru	A	7.3	0.28	56
<b>Chelsea Street/Rutherford Avenue/N. Washington Street</b>	<b>B</b>	<b>16.3</b>		
Chelsea WB left	D	49.7	0.76	201
Chelsea WB thru	D	43.3	0.66	177
Chelsea WB right	A	6.9	0.37	43
N. Washington NB thru   thru   thru	B	17.8	0.20	92
N. Washington NB right	A	4.7	0.38	58
Rutherford SB left	E	65.0	0.66	m115
Rutherford SB thru   thru   thru	A	1.1	0.23	m14
Rutherford SB right	A	2.2	0.49	m41

Table 9. (cont.) Phase 1 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>LT-TL/Rutherford Avenue</b>	<b>C</b>	<b>25.2</b>		
Ramp EB left   left	D	38.7	0.41	88
Ramp EB right   right	A	6.8	0.33	23
Rutherford NB left	D	53.8	0.92	#355
Rutherford NB thru   thru   thru   thru	A	3.5	0.13	28
Rutherford SB thru   thru   thru   thru	C	31.2	0.82	329
Rutherford SB right	A	6.4	0.47	96
<b>Albany Street/Frontage Road</b>	<b>C</b>	<b>25.9</b>		
Albany EB left   left	C	23.2	0.53	148
Albany EB thru	B	19.8	0.05	m15
Albany WB right	C	20.4	0.43	44
Frontage NB thru   thru   thru/right	C	27.8	0.71	335
<b>Neptune Road/Route 1A Off-ramp</b>	<b>C</b>	<b>32.3</b>		
Neptune EB left/thru   thru	A	4.0	0.08	m20
Neptune WB thru   thru/right	C	21.6	0.53	86
Off-Ramp NB left	E	59.4	0.86	249
Off-Ramp NB thru/right	C	33.3	0.45	99

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

m = 95th percentile queue is metered by upstream traffic signal.

\* 25-foot left-turn pocket added during calibration process.

Table 10. Phase 1 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Pearl Street/Atlantic Avenue</b>	<b>A</b>	<b>1.2</b>		
Atlantic WB left/thru   thru   thru	A	1.2	0.48	14
<b>Pearl Street/Purchase Street</b>	<b>A</b>	<b>9.8</b>		
Pearl WB left	D	47.7	0.32	43
Pearl WB left/thru   thru	D	48.5	0.47	53
Purchase SB thru   thru   thru/right	A	5.4	0.61	109
<b>Seaport Boulevard/Atlantic Avenue</b>	<b>E</b>	<b>74.2</b>		
Seaport EB left/thru   thru	D	50.4	0.66	206
Seaport WB thru/bear right	F	114.5	1.11	#510
Seaport WB bear right/right	F	85.3	1.01	#426
Seaport WB right	B	12.6	0.44	m106
Atlantic NB left/bear left	F	85.8	1.06	#681
Atlantic NB left/thru   thru/right	E	72.6	1.05	#570
<b>Oliver Street/Purchase Street</b>	<b>C</b>	<b>26.1</b>		
Oliver WB left/thru   thru	D	52.7	0.82	m80
Purchase SB thru   thru   thru/right	C	23.6	0.82	168
I-93 SWB left	B	10.4	0.46	205
I-93 SWB thru   right	D	37.0	0.55	206
<b>High Street/Atlantic Avenue</b>	<b>B</b>	<b>10.6</b>		
High EB left   left	D	35.6	0.47	72
Atlantic NB thru   thru	A	4.7	0.44	m62
<b>High Street/Purchase Street</b>	<b>A</b>	<b>6.6</b>		
High EB thru   thru/right	B	15.6	0.55	68
Purchase SB left/thru   thru   thru	A	3.9	0.43	41
<b>Broad Street/Purchase Street</b>	<b>A</b>	<b>4.8</b>		
Broad EB right	A	1.7	0.34	0
Purchase SB thru   thru   thru/right	A	5.4	0.30	42
<b>East India Row/Atlantic Avenue</b>	<b>A</b>	<b>9.8</b>		
East India WB thru/right	C	21.8	0.18	26
Atlantic NB left/thru   thru/right	A	9.4	0.46	458
<b>India Street/SASB</b>	<b>A</b>	<b>8.5</b>		
India WB left   left	C	30.8	0.35	56
India WB thru	C	31.7	0.26	49
SASB SB thru   thru   thru/right	A	2.9	0.24	59
<b>Milk Street/Atlantic Avenue</b>	<b>C</b>	<b>28.3</b>		
Milk EB left   left	D	44.4	0.67	54
Milk EB thru	D	38.6	0.34	31
Milk WB right	A	1.7	0.29	0
Atlantic NB thru   thru/right	C	27.5	0.62	370
<b>Milk Street/SASB</b>	<b>B</b>	<b>11.8</b>		
Milk EB thru   thru/right	D	37.0	0.51	107
SASB SB left/thru   thru   thru	A	3.8	0.30	42

Table 10. (cont.) Phase 1 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/Atlantic Avenue</b>	<b>A</b>	<b>2.7</b>		
State WB thru/right	C	24.6	0.33	75
Atlantic NB left/thru   thru   thru/right	A	0.8	0.35	8
<b>State Street/SASB</b>	<b>B</b>	<b>10.7</b>		
State WB left	D	46.4	0.42	106
State WB thru   thru	D	44.1	0.43	84
SASB SB thru   thru   thru/right	A	1.0	0.37	4
<b>Mercantile Street/Atlantic Avenue/Cross Street</b>	<b>B</b>	<b>19.4</b>		
Mercantile EB left/thru   thru	D	51.7	0.55	77
Atlantic WB thru   thru/right	D	36.0	0.47	101
Atlantic NB left/thru   thru	A	7.9	0.34	83
Atlantic NB right	A	4.1	0.48	55
<b>Mercantile Street/SASB</b>	<b>C</b>	<b>22.0</b>		
Mercantile WB left   left	E	73.9	0.67	95
SASB SB left/thru   thru   thru	A	8.2	0.31	75
<b>Commercial Street/Cross Street</b>	<b>A</b>	<b>0.8</b>		
Commercial WB right	A	1.4	0.20	0
Cross NB thru   thru	A	0.7	0.27	4
<b>Clinton Street/SASB</b>	<b>C</b>	<b>24.5</b>		
I-93 WB left	D	48.5	0.70	215
I-93 WB left/thru	D	47.9	0.71	184
SASB SB thru   thru   thru/right	A	8.1	0.33	57
<b>Kneeland Street/SASB</b>	<b>C</b>	<b>27.6</b>		
Kneeland EB thru   thru	D	47.0	0.79	210
Kneeland EB right	B	16.0	0.78	113
Kneeland WB left	D	52.5	0.75	m133
Kneeland WB thru   thru	D	40.8	0.46	m18
SASB SB left/thru   thru   thru/right	B	17.2	0.79	#402
<b>Beach Street/SASB</b>	<b>A</b>	<b>7.8</b>		
Beach WB left	D	45.0	0.63	92
SASB SB thru   thru   thru	A	3.7	0.44	75
<b>Essex Street/Lincoln Street/SASB</b>	<b>C</b>	<b>33.6</b>		
Essex EB left/thru   thru	D	48.6	0.85	212
Essex EB right/hard right	C	27.3	0.46	m109
SASB SB left/thru   thru   thru/right	D	42.6	0.79	164
I-93 Ramp NWB left/thru   thru   thru/right	C	24.9	0.68	280
<b>Essex Street/South Street</b>	<b>B</b>	<b>12.9</b>		
Essex EB thru   thru/right	A	6.3	0.25	29
South WB left   left	C	34.4	0.33	56
<b>Summer Street/Purchase Street/SASB</b>	<b>D</b>	<b>44.0</b>		
Summer EB thru	F	110.9	0.69	166
Summer EB right	C	24.5	0.35	48
Summer WB left	D	47.8	0.77	m#260
Summer WB left/thru   thru	C	33.7	0.77	m215
Purchase SB left/thru   thru/right	D	43.1	0.82	#211
I-90 off-ramp SWB left/thru   thru/right	D	36.6	0.66	246



Table 10. (cont.) Phase 1 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/Purchase Street</b>	<b>F</b>	<b>85.4</b>		
Congress EB thru   thru	B	10.3	0.66	36
Congress EB bear right (de facto)	F	206.3	1.40	#793
Congress EB right	A	8.6	0.34	m20
Purchase SB hard left	B	14.2	0.62	59
Purchase SB bear left (de facto)	F	129.5	1.22	#862
Purchase SB thru	B	11.9	0.50	49
<b>Kneeland Street/Lincoln Street</b>	<b>C</b>	<b>25.5</b>		
Kneeland EB left/thru   thru/right	C	26.3	0.75	114
Kneeland WB left/thru   thru   thru/right	D	36.7	0.81	182
Lincoln NB left/thru   thru	B	16.6	0.37	201
Lincoln NB right	A	4.3	0.19	17
<b>North Street/SASB</b>	<b>B</b>	<b>17.8</b>		
North Street EB right	A	4.0	0.17	16
I-93 WB left/thru   thru	A	5.3	0.21	77
SASB SB thru   thru/right	C	34.1	0.78	75
<b>North Street/Cross Street</b>	<b>C</b>	<b>26.9</b>		
I-93 EB left	C	27.6	0.51	248
I-93 EB left/thru	C	28.8	0.56	218
Cross NB thru   thru/right	C	26.1	0.82	175
<b>Hanover Street/SASB</b>	<b>B</b>	<b>13.5</b>		
Hanover EB thru   thru/right	C	20.6	0.15	30
Hanover WB left	B	17.3	0.26	m69
Hanover WB thru	B	16.7	0.19	m77
SASB SB left/thru   thru/right	B	10.5	0.29	m117
<b>Hanover Street/Cross Street</b>	<b>B</b>	<b>12.6</b>		
Hanover EB left	D	39.5	0.36	43
Hanover EB thru	C	34.5	0.31	70
Hanover WB thru/right	D	53.1	0.81	184
Cross NB left/thru   thru/right	A	3.0	0.62	104
<b>New Sudbury Street/SASB</b>	<b>C</b>	<b>28.9</b>		
New Sudbury EB thru   thru	B	16.2	0.45	m128
New Sudbury EB right	A	4.4	0.36	m22
SASB SB left/thru   thru	C	30.7	0.63	m104
Haymarket Station SEB right	F	138.2	1.06	38
<b>New Sudbury Street/Cross Street</b>	<b>B</b>	<b>11.2</b>		
New Sudbury EB left   left	B	10.9	0.54	64
Cross NB left/thru   thru	B	11.5	0.74	304
<b>New Chardon Street/SASB</b>	<b>D</b>	<b>37.4</b>		
New Chardon EB bear right   bear right	D	44.1	0.95	#515
New Chardon EB right	B	16.2	0.20	46
SASB SB left	C	33.8	0.91	#351
SASB SB left/thru   thru/right	D	44.2	0.90	#324
SASB SB right	D	43.8	0.90	#288
I-93 NWB left   left	C	21.0	0.42	122

Table 10. (cont.) Phase 1 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>North Washington Street/Cross Street</b>	<b>B</b>	<b>13.7</b>		
Cooper Street WB right	A	1.0	0.16	0
I-93 NB thru   thru	D	47.8	0.56	83
Cross NWB bear right   bear right	A	5.1	0.43	146
<b>North Washington Street/Beverly Street</b>	<b>B</b>	<b>14.7</b>		
N. Washington SB thru   thru   thru	B	15.3	0.64	144
Beverly SEB right   right   right	B	12.6	0.25	m94
<b>Valenti Way/Beverly Street</b>				
Valenti WB left	A	0.6	0.21	20
<b>Valenti Way/North Washington Street</b>	<b>D</b>	<b>46.4</b>		
N. Washington NB left (de facto)	F	131.9	1.07	#352
N. Washington NB thru/right	E	58.1	0.85	#705
N. Washington SB left/thru   thru   thru/right	B	17.9	0.85	434
<b>Congress Street/Atlantic Avenue</b>	<b>B</b>	<b>13.2</b>		
Congress EB left   left	C	29.3	0.74	177
Congress EB thru   thru	A	2.2	0.32	22
Congress WB right   right	A	3.5	0.45	m8
Atlantic NB thru   thru   thru/right	B	15.7	0.75	100
<b>Summer Street/Atlantic Avenue</b>	<b>C</b>	<b>23.2</b>		
Summer EB left/thru   thru	C	35.0	0.67	m192
Summer WB thru   thru   thru/right	B	16.4	0.54	105
Atlantic NB left/thru   thru   thru	C	23.8	0.76	96
Atlantic NB right	C	24.7	0.69	156
<b>Essex Street/Atlantic Avenue</b>	<b>B</b>	<b>18.8</b>		
Essex EB left   left	C	26.7	0.47	145
Atlantic NB left/thru   thru   thru	B	15.8	0.55	103
<b>Beach Street/Atlantic Avenue</b>	<b>A</b>	<b>7.2</b>		
Atlantic NB left/thru   thru   thru	A	7.2	0.57	134
<b>Kneeland Street/Atlantic Avenue/I-90 WB Off-Ramps</b>	<b>C</b>	<b>31.4</b>		
Kneeland EB left	D	41.5	0.76	m180
Kneeland EB left/thru	D	35.7	0.69	m172
MBTA Drive WB thru/right	D	40.0	0.10	8
Frontage NB left	C	26.3	0.33	153
Frontage NB left/thru	C	28.2	0.45	205
I-90 WB Off-Ramp NWB left	E	59.0	0.79	#216
I-90 WB Off-Ramp NWB thru	B	13.2	0.41	220
<b>North Street/Clinton Street</b>	<b>C</b>	<b>22.9</b>		
North EB thru	C	23.9	0.17	54
North WB thru   thru	C	21.2	0.55	239
Clinton NB left   left/right	C	26.2	0.59	73
<b>Purchase Street/Fire Station</b>				
Fire Station EB right	B	10.8	0.26	26
Purchase SB thru   thru   thru/right	A	0.0	0.33	0

Table 10. (cont.) Phase 1 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>State Street/Congress Street</b>	<b>C</b>	<b>22.8</b>		
State WB left/thru   thru/right	C	33.0	0.67	213
Congress NB thru   thru	C	22.5	0.48	114
Congress SB thru   thru/bear right	C	15.5	0.62	171
Congress SB right	C	18.5	0.60	191
<b>North Street/Congress Street</b>	<b>C</b>	<b>26.3</b>		
North WB left   left/right	E	55.1	0.77	223
Congress NB thru   thru   thru/right	A	6.2	0.53	20
Congress SB left/thru   thru   thru	B	19.9	0.72	69
<b>North Street/Union Street</b>	<b>A</b>	<b>4.4</b>		
North EB left/thru   thru	A	4.4	0.06	m12
North WB thru   thru/right	A	4.4	0.38	32
<b>Hanover Street/Congress Street</b>	<b>A</b>	<b>2.6</b>		
Hanover WB left	B	17.2	0.28	71
Congress NB thru   thru   thru/right	A	0.3	0.27	3
Congress SB thru   thru   thru	A	2.4	0.21	36
<b>New Sudbury Street/Congress Street/Merrimac Street</b>	<b>D</b>	<b>50.8</b>		
New Sudbury EB left	E	77.7	0.96	#337
New Sudbury EB thru   thru	D	38.5	0.63	191
New Sudbury EB right	A	7.8	0.48	32
Congress NB thru   thru	D	51.2	0.72	285
Congress NB right (de facto)	F	83.3	0.95	#351
Merrimac SB left	F	82.2	0.97	m#97
Merrimac SB thru   thru   thru	C	28.8	0.22	m69
<b>New Chardon Street/Merrimac Street</b>	<b>E</b>	<b>58.6</b>		
New Chardon EB left/thru   thru/right	A	7.0	0.62	11
New Chardon WB hard left/left	F	234.2	1.37	55
New Chardon WB thru   thru/right	A	8.6	0.31	67
Merrimac NB hard left/left	E	62.7	0.96	m#318
Merrimac NB thru	D	43.0	0.81	m#209
Merrimac NB right (de facto)	B	13.1	0.67	m111
Merrimac SB left (de facto)	F	151.9	1.18	#337
Merrimac SB thru   thru/right	A	36.1	0.58	114
<b>Summer Street/Dorchester Avenue</b>	<b>C</b>	<b>28.1</b>		
Summer EB left/thru   thru/right	C	34.6	0.69	#193
Summer WB left/thru   thru/right	B	17.5	0.69	225
Dorchester NB left/thru/right	B	18.2	0.33	39
Dorchester SB left	E	58.0	0.91	#332
Dorchester SB thru/right	A	2.9	0.28	27
<b>Summer Street/Melcher Street</b>	<b>C</b>	<b>20.4</b>		
Summer EB thru   thru/right	B	10.7	0.51	m198
Summer WB left/thru   thru	B	17.1	0.40	216
Melcher NB left/right	D	51.1	0.81	238

Table 10. (cont.) Phase 1 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Summer Street/Pump House Road</b>	<b>B</b>	<b>15.2</b>		
Summer EB left/thru   thru	A	5.9	0.39	130
Summer WB thru   thru   thru/right	A	9.9	0.28	136
Driveway NB left/thru/right	A	0.0	0.00	0
Pump House SB left	D	50.0	0.69	145
Pump House SB left/right	D	39.9	0.64	131
<b>Massport Haul Road/Pump Station Connector</b>	<b>B</b>	<b>12.7</b>		
Haul EB thru	B	13.4	0.06	29
Haul EB right	A	3.2	0.25	48
Haul WB left	A	6.6	0.11	47
Haul WB thru	A	6.6	0.16	90
Pump Station NB left   left/right	C	29.1	0.45	41
<b>Summer Street/D Street</b>	<b>C</b>	<b>23.9</b>		
Summer EB left	D	31.2	0.69	238
Summer EB thru   thru/right	C	20.5	0.45	223
Summer WB left/thru   thru	C	27.8	0.60	51
Summer WB right	A	8.1	0.25	33
D Street NB left	D	37.6	0.36	85
D Street NB thru   thru/right	C	34.2	0.34	98
D Street SB left	C	30.9	0.68	m192
D Street SB thru   thru/right	B	17.0	0.67	135
<b>Ramp DB (I-90 WB On Ramp)/D Street</b>	<b>B</b>	<b>14.4</b>		
D Street NB left	D	50.3	0.72	237
D Street NB thru   thru	A	0.8	0.16	49
D Street SB thru   thru/right	B	10.9	0.52	216
<b>Transitway/D Street</b>	<b>A</b>	<b>7.9</b>		
Transitway EB thru	D	50.0	0.38	43
Transitway WB thru	D	51.7	0.43	51
D Street NB thru   thru   thru/right	B	10.5	0.19	63
D Street SB thru   thru	A	2.9	0.38	68
<b>Congress Street/D Street</b>	<b>D</b>	<b>38.9</b>		
Congress EB left/thru   thru/right	C	29.7	0.47	95
Congress EB right	B	19.0	0.53	m194
Congress WB left/thru   thru/right	D	50.3	0.76	102
D Street NB left	D	50.6	0.75	197
D Street NB left/thru   thru/right	C	36.5	0.63	125
D Street SB left/thru   thru/right	D	47.7	0.82	244
<b>Congress Street/B Street/Ramps D&amp;F</b>	<b>C</b>	<b>29.5</b>		
Congress EB left/thru   thru	D	43.2	0.73	193
Congress EB right	B	11.0	0.46	m31
Congress WB left	C	29.0	0.60	218
Congress WB left/thru   thru/right	C	23.3	0.51	170
Ramp NB left	E	68.5	0.76	#161
Ramp NB thru	C	25.4	0.19	65
Ramp NB right	A	5.5	0.46	31
B Street SB thru   thru	D	41.7	0.60	135
B Street SB right	C	21.8	0.25	50

Table 10. (cont.) Phase 1 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/East Service Road/Ramps I&amp;C</b>	<b>C</b>	<b>22.8</b>		
Congress EB left	A	5.9	0.07	m9
Congress EB thru   thru	A	6.0	0.19	M46
Congress WB thru   thru	B	13.4	0.17	m94
Congress WB right	A	8.2	0.04	m8
Ramp I NB left/thru   thru	D	44.0	0.33	51
Ramp I NB right	B	13.8	0.49	35
Ramp C NEB thru   thru/right	D	44.9	0.70	117
<b>Congress Street/Boston Wharf Road</b>	<b>C</b>	<b>22.1</b>		
Congress EB left/thru	C	20.4	0.42	m152
Congress EB right	A	4.9	0.35	m45
Congress WB left	B	10.5	0.31	19
Congress WB thru   thru/right	A	6.0	0.20	m28
Boston Wharf NB left	D	46.8	0.29	56
Boston Wharf NB thru/right	C	28.5	0.19	14
Boston Wharf SB left/thru	D	52.7	0.88	257
Boston Wharf SB right	A	4.6	0.20	16
<b>Seaport Boulevard (Northern Avenue)/ B Street</b>	<b>C</b>	<b>20.9</b>		
Seaport EB thru   thru/right	B	13.9	0.63	152
Seaport WB left/thru   thru	B	19.0	0.57	179
B Street NB left   left	D	49.3	0.73	129
B Street NB right	B	12.1	0.46	m49
<b>Seaport Boulevard/Northern Avenue/East Service Road</b>	<b>C</b>	<b>26.3</b>		
Seaport EB left	B	16.6	0.27	38
Seaport EB thru   thru	B	15.7	0.50	178
Seaport WB thru   thru/right	C	22.7	0.70	#405
East Service NB left	E	55.7	0.67	143
East Service NB thru	D	38.1	0.11	m15
East Service NB right	C	21.8	0.59	33
Northern SB left	D	49.1	0.63	158
Northern SB left/right	D	36.6	0.57	142
<b>Seaport Boulevard/Sleeper Street</b>	<b>B</b>	<b>19.3</b>		
Seaport EB left/thru   thru	C	23.0	0.46	m176
Seaport EB right	B	11.1	0.11	m39
Seaport WB left	A	7.6	0.01	m4
Seaport WB thru   thru/right	A	11.2	0.36	236
Sleeper NB left/thru/right	D	54.5	0.76	94
Sleeper SB left/thru	C	34.3	0.31	55
Sleeper SB right	B	12.8	0.56	73
<b>Congress Street/Dorchester Avenue</b>	<b>C</b>	<b>26.1</b>		
Congress EB thru	C	22.0	0.39	159
Congress EB right	A	7.5	0.44	m88
Congress WB left/thru	C	27.6	0.62	201
Dorchester NB left/right	D	52.2	0.89	#292

Table 10. (cont.) Phase 1 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Congress Street/A Street</b>	<b>D</b>	<b>42.7</b>		
Congress EB left/thru   thru	D	51.8	0.85	m#356
Congress EB right	A	5.0	0.26	m47
Congress WB left	D	48.4	0.86	#286
Congress WB thru/right	B	13.8	0.28	112
A Street NB left/thru/right	E	64.9	0.95	83
Thompson SB left/thru/right	C	30.3	0.23	32
<b>Summer Street/West Side Drive</b>	<b>A</b>	<b>6.1</b>		
Summer EB thru   thru/right	A	6.1	0.41	32
Summer WB left	A	5.1	0.09	4
Summer WB thru   thru	A	3.5	0.20	34
West Side NB left	D	41.8	0.11	30
West Side NB right	B	15.4	0.24	11
<b>Summer Street/WTC Avenue</b>	<b>A</b>	<b>7.6</b>		
Summer EB left	A	2.5	0.06	4
Summer EB thru   thru	A	2.9	0.34	36
Summer EB right	A	0.4	0.16	0
Summer WB left	A	6.8	0.24	m26
Summer WB thru   thru/right	A	10.5	0.21	130
WTC NB left	D	46.5	0.31	49
WTC NB thru/right	A	0.3	0.10	0
WTC SB left	D	46.9	0.30	43
WTC SB thru/right	B	19.6	0.14	0
<b>Seaport Boulevard/Boston Wharf Road</b>	<b>B</b>	<b>14.7</b>		
Seaport EB thru   thru/right	B	19.4	0.36	182
Seaport WB left	A	5.5	0.19	m29
Seaport WB thru   thru	A	5.1	0.37	95
Boston Wharf NB left   left/right	D	44.4	0.53	88
<b>SSCONN/Albany Street</b>	<b>A</b>	<b>7.4</b>		
SSCONN WB left   left	E	57.4	0.46	52
Albany SB left/thru   thru   thru	A	3.0	0.44	92
<b>Broadway Bridge/Frontage Road</b>	<b>D</b>	<b>42.6</b>		
Traveler EB hard left	D	51.7	0.34	54
Traveler EB left	F	92.6	0.48	m144
Traveler EB thru   thru	A	9.7	0.38	72
Broadway WB right	C	21.2	0.08	43
Broadway WB hard right (de facto)	E	75.1	1.01	#578
Frontage NB thru   thru	C	25.3	0.04	m11
Frontage NB right   right   right/hard right	D	40.3	0.84	217
<b>Bennington Street/Neptune Road</b>	<b>D</b>	<b>35.9</b>		
Bennington EB left/thru   thru/right	D	39.5	0.19	56
Bennington WB left/thru   thru/right	C	31.9	0.83	m80
Neptune NB left/thru   thru/right	D	53.2	0.91	#466
Neptune SB left/thru   thru/right	B	19.7	0.55	237

Table 10. (cont.) Phase 1 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>SSECONN/Ramps K&amp;X</b>	<b>B</b>	<b>14.3</b>		
SSECONN EB left/thru	D	50.5	0.25	32
SSECONN EB right	B	18.6	0.55	119
SSECONN WB left	E	60.9	0.49	36
SSECONN WB thru/right	C	30.4	0.54	55
Ramp NB left/thru   thru/right	A	8.5	0.24	119
Ramp SB left	A	1.6	0.02	m1
Ramp SB left/thru   thru/right	A	0.7	0.10	m4
<b>East Berkeley Street/Albany Street</b>	<b>B</b>	<b>17.8</b>		
East Berkeley WB left/thru   thru   thru	B	14.0	0.46	m86
Albany SB thru   thru   thru/right	C	22.7	0.52	214
<b>West 4<sup>th</sup> Street/Frontage Road</b>	<b>C</b>	<b>32.3</b>		
West 4 <sup>th</sup> WB thru   thru   thru/right	D	52.3	0.92	#363
Frontage NB left	B	19.6	0.62	#548
Frontage NB thru   thru/right	B	17.3	0.62	356
<b>Traveler Street/Albany Street</b>	<b>B</b>	<b>16.1</b>		
Traveler EB thru/right	D	52.3	0.78	241
Albany SB left	A	4.9	0.58	149
Albany SB left/thru   thru/right	B	11.8	0.48	292
<b>Herald Street/Albany Street</b>	<b>C</b>	<b>22.7</b>		
Herald EB right   right   right	B	13.6	0.53	184
Albany SB thru   thru   thru	C	29.2	0.83	224
<b>MBTA Bus Lot (near Randolph)/Albany Street</b>	<b>F</b>	<b>99.4</b>		
MBTA EB thru/right	D	38.6	0.09	12
Albany SB left	B	14.2	0.37	73
Albany SB left/bear left   bear left	C	31.4	0.36	158
Albany SB thru/right	A	7.9	0.39	262
Albany NB right   right	F	197.8	0.92	380
<b>Ramp A2/Ramp I/Frontage Road</b>	<b>C</b>	<b>29.3</b>		
Frontage SB thru	C	33.1	0.51	211
Frontage SB right	C	27.5	0.12	60
Ramp SWB left/thru   thru	C	28.7	0.93	470
<b>Nashua Street/Martha Road</b>	<b>A</b>	<b>8.8</b>		
Nashua WB left   left	A	8.6	0.43	54
Martha SB thru   thru	A	8.9	0.48	105
<b>Chelsea Street/Rutherford Avenue/N. Washington Street</b>	<b>C</b>	<b>25.5</b>		
Chelsea WB left	E	65.0	0.98	#692
Chelsea WB thru	C	29.3	0.56	322
Chelsea WB right	A	4.0	0.27	30
N. Washington NB thru   thru   thru	D	42.5	0.42	115
N. Washington NB right	B	11.8	0.77	126
Rutherford SB left	E	66.8	0.95	#386
Rutherford SB thru   thru   thru	A	6.4	0.62	89
Rutherford SB right	A	5.3	0.67	m34

Table 10. (cont.) Phase 1 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>LT-TL/Rutherford Avenue</b>	<b>C</b>	<b>32.9</b>		
Ramp EB left   left	D	41.0	0.58	198
Ramp EB right   right	D	53.5	0.83	#272
Rutherford NB left	D	37.2	0.70	m118
Rutherford NB thru   thru   thru   thru	A	6.0	0.11	m23
Rutherford SB thru   thru   thru   thru	C	34.0	0.76	429
Rutherford SB right	A	7.3	0.26	112
<b>Albany Street/Frontage Road</b>	<b>C</b>	<b>23.1</b>		
Albany EB left   left	C	20.6	0.62	m55
Albany EB thru	B	11.5	0.06	m7
Albany WB right	B	17.7	0.45	35
Frontage NB thru   thru   thru/right	C	25.0	0.63	361
<b>Neptune Road/Route 1A Off-ramp</b>	<b>D</b>	<b>37.3</b>		
Neptune EB left/thru   thru	A	4.9	0.04	m8
Neptune WB thru   thru/right	B	16.2	0.63	123
Off-Ramp NB left	E	65.8	0.92	456
Off-Ramp NB thru/right	D	43.3	0.69	328

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

m = 95th percentile queue is metered by upstream traffic signal.

\* 25-foot left-turn pocket added during calibration process.

During the morning peak period, 33 of the 81 intersections have an improved overall LOS under Phase 1 conditions. Some of the intersections have an LOS that is worse than the Existing conditions due to the increase in vehicle and pedestrian clearance times. Of the 8 locations that are expected to get worse, only 1 has a failing LOS.

Under mid-day Phase 1 conditions, 25 of the 81 intersections have an improved LOS. 7 intersections get worse; however, none of these locations are failing.

During the evening peak hour, 21 intersections show an improvement in LOS. 7 intersections get worse; however, none of these locations are failing.



## Phase 2 Improvements

Improvements identified in Phase 2 consisted of those that had to be made at the controller and any changes that may affect the approach geometry. These include changes to *pavement markings and signage, pedestrian phases, protected turn phases, and parking regulations.*

### *Pavement Marking & Signage Improvements*

HSH recommends updating some of the existing signage and pavement markings at some of the study area locations. These improvements will help clarify restrictions as well as provide advanced warning of lane usage.

### **Seaport Boulevard/Atlantic Avenue**

On the northbound Atlantic Avenue approach at Seaport Boulevard/Atlantic Avenue, there are three travel lanes with 4 different directions in which to proceed: left onto Oliver Street, bear left onto I-93 NB, through to continue onto Atlantic Avenue, and right onto Seaport Boulevard. For this approach, there is much driver confusion regarding which lane to use for their specific destination. After doing field observations, the lanes normally act as a shared left/bear left lane, a shared bear left/through lane, and a shared through/right-turn lane. HSH recommends striping the northbound lanes with arrow markings as well as dashed guide lines. A lane use sign is also suggested to give drivers advanced warning.



**Photo 1.** Atlantic Avenue looking north at Seaport Boulevard/Atlantic Avenue

## Essex Street/Lincoln Street/SASB

There are three approaches to the intersection Essex Street/Lincoln Street/Surface Artery Southbound (SASB), and three departure legs, making this intersection geometry confusing for drivers. The eastbound Essex Street approach also lacks clear and accurate pavement markings and signage: the existing overhead guide sign directs drivers heading to Interstate 93 South to use the right lane, but channelized pavement markings seemingly direct traffic in the right lane onto SASB instead. Based upon traffic volume data collected, HSH recommends updating the guide sign on the eastbound approach to direct drivers in the left lane to Interstate 93 North and Lincoln Street, drivers in the center lane to Essex Street, South Station, and Interstate 93 South, and drivers in the right lane to SASB and Interstate 90. Pavement markings directing vehicles to the interstate highway system could also be added to further guide drivers.



**Photo 2. Essex Street looking east at Essex Street/Lincoln Street/SASB**

A No Left Turn sign is located at the stop line on Essex Street that presumably is there to stop vehicles from turning onto SASB, heading the wrong-way on a one-way street, but also legally prohibits vehicles from turning left onto Lincoln Street. A concurrent pedestrian phase across the northern leg of Lincoln Street also exists during the Essex Street phase. Over 70 vehicles per hour still make this safe, but illegal, turn during both the morning and mid-day peak hours. HSH recommends removing the No Left Turn sign on this approach and relocating the Do Not Enter sign on the north side of SASB from the existing street light to the existing signal post, where it will be closer to the intersection and more visible to approaching vehicles. In order to increase pedestrian safety, the concurrent pedestrian phase across Lincoln Street could also be moved so that it operates concurrently with SASB where fewer vehicle and pedestrian conflicts would exist.



## Congress Street/Purchase Street

After field observations, HSH noticed driver confusion when traveling along Purchase Street toward this intersection. On the southbound approach at Congress Street/Purchase Street, the lanes are supposed to be an exclusive hard-left lane, a shared bear left/through lane, and a through lane. Currently some vehicles in the left-most lane try to bear left onto I-93 along with those in the middle lane. However, the I-93 ramp only has 1 receiving lane causing dangerous merging situations for vehicles. In order to prevent this situation, HSH recommends adding signage with lane use diagrams prior to this approach. Pavement marking arrows and I-93 text are also suggested for the middle lane.



**Photo 3. Purchase Street looking south at Congress Street/Purchase Street**

Additionally, the eastbound Congress Street approach to this intersection could benefit from new pavement markings that instruct drivers in the right-most lane to only turn onto Purchase Street and drivers looking to turn onto I-93 South use the second lane from the right.



**Photo 4.** Congress Street looking east at Congress Street/Purchase Street

## Valenti Way/North Washington Street

The northbound North Washington Street approach currently consists of a shared left-turn/through lane and a shared through/right-turn lane. During the morning and evening peak hours, the left-most lane at this approach acts as a de facto left-turn lane due the high volumes turning left onto Valenti Way from North Washington Street. Since the existing cross-section is wide enough to accommodate an additional lane without dropping the parking lane or a southbound lane, HSH recommends that this approach be re-stripped to consist of an exclusive left-turn lane, a through lane, and a shared through/right-turn lane.



**Photo 5.** North Washington Street looking north at Valenti Way/North Washington Street



## **Seaport Boulevard/B Street**

At Seaport Boulevard/B Street, the eastbound approach is currently striped as a through lane and an exclusive right-turn lane. The right turn lane has a protected turn overlap during the northbound phase. Currently, vehicles traveling eastbound use both travel lanes to continue straight on Seaport Boulevard since there are two receiving lanes on the opposite side of the intersection. HSH recommends re-striping the eastbound approach as a through lane and a shared through/right-turn lane. The right-turn overlap phase and the no turn on red sign should be removed from the eastbound approach.



*Photo 6. Seaport Boulevard looking east at Seaport Boulevard/B Street*

### ***Protected Turn Phases to be Removed***

Using the BTG guidelines, Protected/Permissive or Split phasing is not required at some of the locations.

## **Congress Street/A Street**

At Congress Street/A Street, the northbound and southbound approaches have split phases. Turning volumes are generally low at this intersection. However, due to the skewed geometry, HSH recommends keeping the split phasing at this location.

## **Summer Street/West Side Drive**

At Summer Street/West Side Drive, the westbound Summer Street approach has a permissive phase and a protected phase. Left turn volumes are very low at this intersection and do not require a protected phase. HSH suggests removing the protected phase at this location. Removing the extra phase will decrease the delay for the northbound approach as well as pedestrians. It will also allow for improvement in the progression along Summer Street.

## **Summer Street/World Trade Center Avenue**

Currently, the eastbound and westbound Summer Street approaches have leading left-turn phases at Summer Street/World Trade Center Avenue. The left-turning volumes at this location are relatively low and do not require a protected phase. Removing a phase will decrease delay and allow for improved progression along Summer Street. HSH recommends working with the Convention Center on this issue.

## **Seaport Boulevard/Boston Wharf Road**

At Seaport Boulevard/Boston Wharf Road, the westbound Seaport Boulevard approach has a permissive phase and a protected phase. Left turn volumes are very low at this intersection and do not require a protected phase. HSH suggests removing the protected phase at this location. Removing the extra phase will decrease the delay for pedestrians and allow for improved progression along Seaport Boulevard.

## *Phasing Sequence Changes*

### **New Chardon Street/Merrimack Street**

At New Chardon Street/Merrimack Street, the LOS is at an E or F during the morning and evening peak hours under Existing and Phase 1 Conditions. Due to the geometry of this location and the heavy left-turn movements in the northbound and westbound directions, the intersection currently operates with 5 phases.

HSH has considered different options for improving operations at this intersection. While the volumes are low enough in the east and westbound directions to allow a protected/permissive movement, the geometry of the intersection as well as the placement of the crosswalks make it unsafe. The phasing is such that the eastbound traffic runs concurrent with the crossing of Merrimack on the south side of the intersection. This crossing is skewed to the eastbound left turns and set back far enough where pedestrians may not be seen easily if this phase were to run permissive. More importantly, although the entrance into the garage is supposed to happen from the westbound through lane, many vehicles use the protected left lane to get ahead of the eastbound traffic. Should this continue to occur during the permissive phase, this would lead to a head-on conflict.

To accommodate the heavy westbound left turn movement, allowing left turns from the middle lane is recommended to increase capacity. The lanes should be re-stripped to have an exclusive left-turn lane, a shared left-turn/bear left/through lane, and a shared through/right-turn lane. To lower the number of phases at New Chardon Street/Merrimack Street, HSH suggests that all approaches operate with split phasing. The first phase will be for the northbound approach, with a concurrent crossing for the eastern crosswalk from the island to the opposite side of New Chardon Street. The second phase will be for the westbound approach, with an overlap for the northbound right turns. The third phase is for the eastbound approach, with concurrent crossings for the northern and southern crosswalks. The fourth phase is the southbound approach along with the garage exit. The southern pedestrian crossing will run concurrent with this last phase. Since the westbound phase is no longer followed by the garage movement, the 7-second clearance interval to clear the vehicles past the garage exit is not needed. However, there should be a setting into the controller to call the third phase before allowing Phase 4.

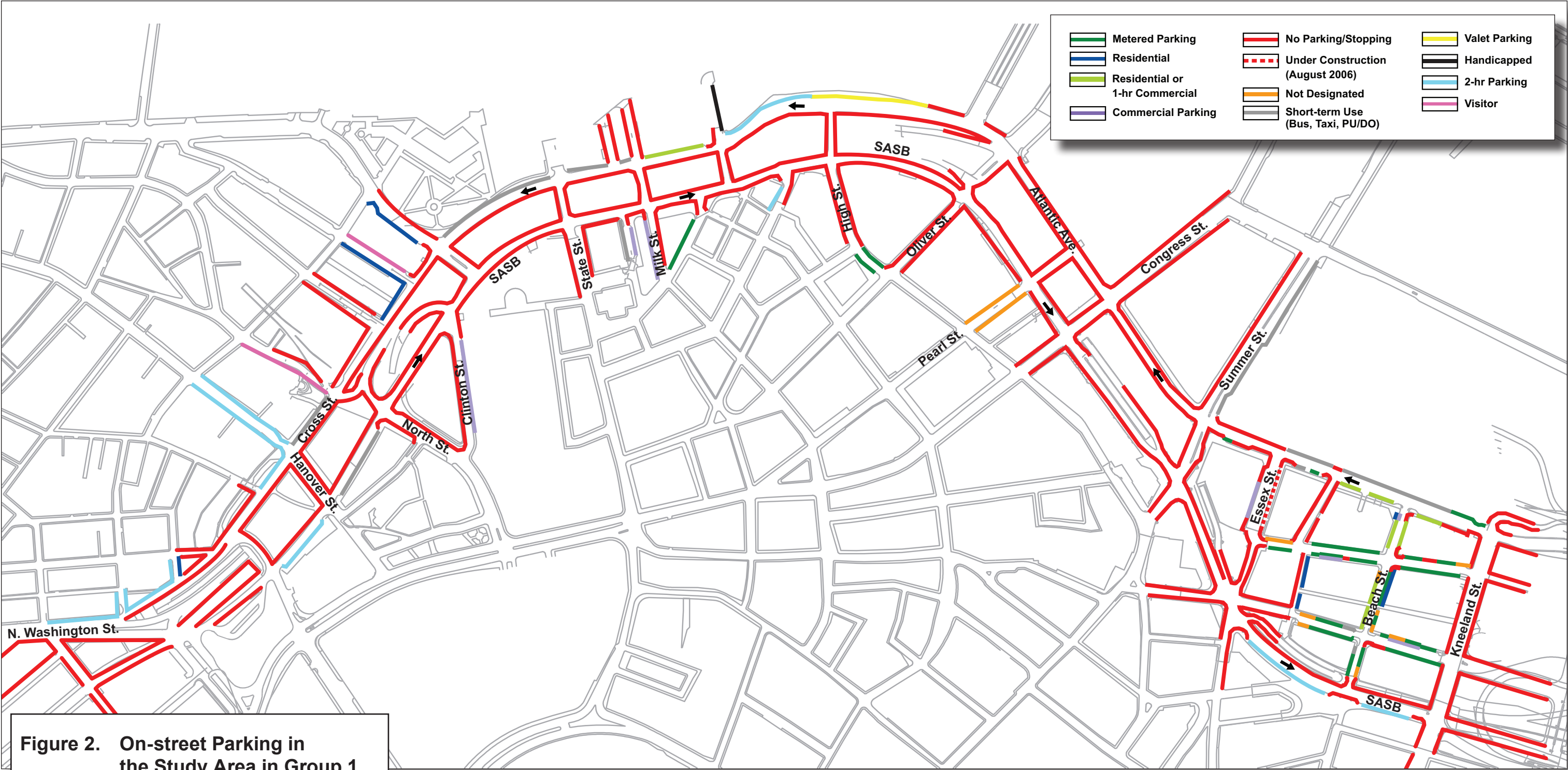
## *Coordinated Phase Changes*

HSH examined changing the coordinated phase at locations where the side street is currently set as the coordinated phase. However, the intersections seem to benefit very little or worsened when changing the coordination. At this time, HSH does not recommend changing the coordinated phase at any of the locations.

### *Parking Regulations*

At this time, HSH is proposing no changes to existing parking regulations within the study area.

See **Figure 2** to **Figure 4** for Existing On-street parking in the study area.



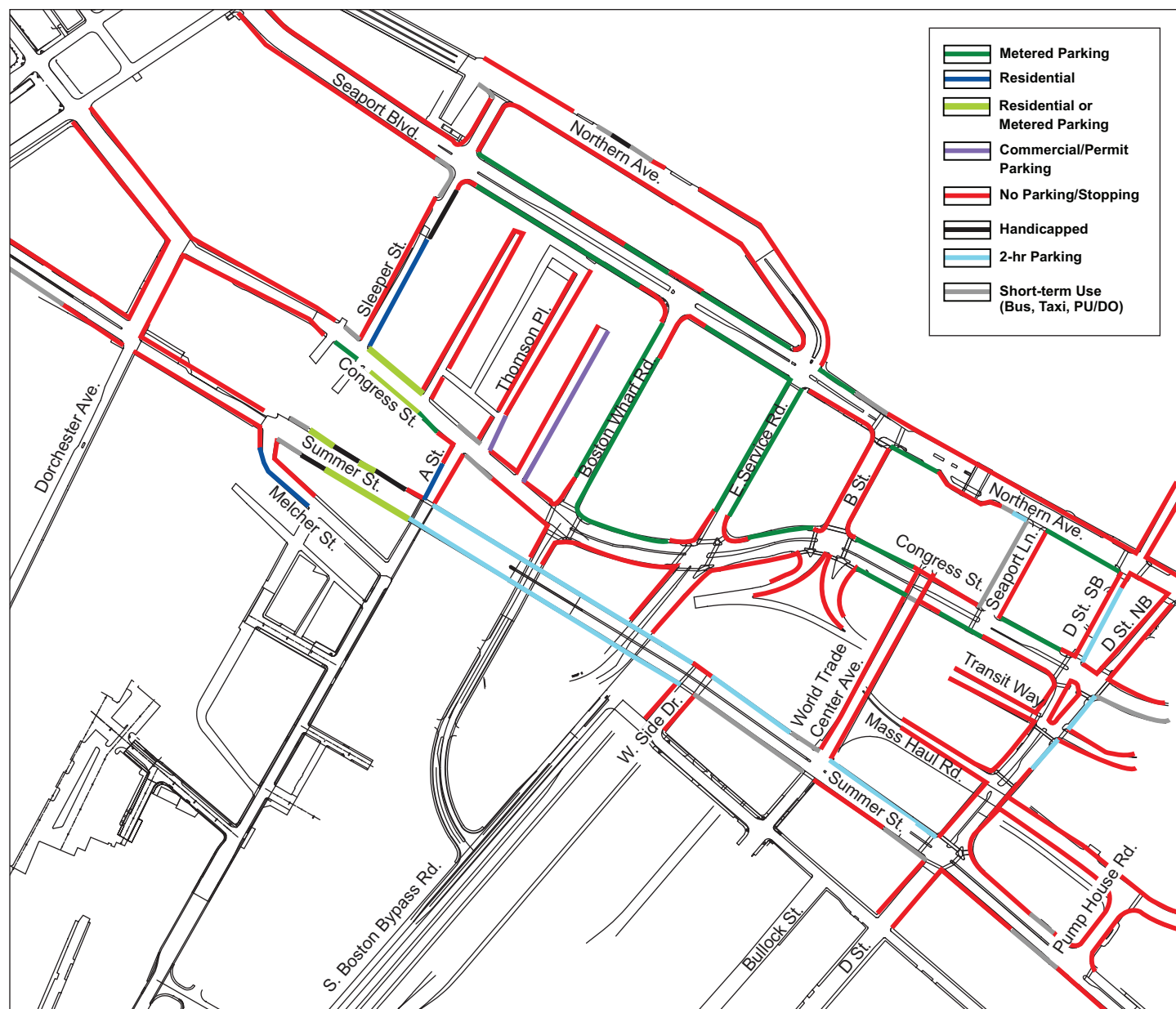
**Figure 2. On-street Parking in the Study Area in Group 1**



Not to scale.



**Figure 3. On-Street Parking in the Study Area in Group 2**



Not to scale.

Figure 4. On-Street Parking in the Study Area in Group 3



Not to scale.

- Residential
- No Parking/Stopping
- Not Designated
- 2-hr Parking
- Short-term Use (Bus, Taxi, PU/DO)



## Phase 2 Synchro Analysis

Table 11 through Table 13 show the results of the Phase 2 Synchro analysis.

Table 11. Phase 2 Intersection Operations, a.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Valenti Way/North Washington Street</b>	<b>B</b>	<b>15.7</b>		
N. Washington NB left	E	58.3	0.83	217
N. Washington NB thru   thru/right	A	5.9	0.39	96
N. Washington SB left/thru   thru   thru/right	B	11.9	0.62	256
<b>Summer Street/West Side Drive</b>	<b>A</b>	<b>4.7</b>		
Summer EB thru   thru/right	A	0.3	0.28	3
Summer WB left	B	11.2	0.10	15
Summer WB thru   thru	A	8.9	0.24	86
West Side NB left	D	40.2	0.02	13
West Side NB right	C	23.2	0.05	6
<b>Summer Street/WTC Avenue</b>	<b>A</b>	<b>7.6</b>		
Summer EB left	A	3.4	0.05	2
Summer EB thru   thru	A	3.0	0.27	19
Summer EB right	A	0.4	0.07	0
Summer WB left	A	9.3	0.15	m26
Summer WB thru   thru/right	A	8.1	0.26	78
WTC NB left	D	43.6	0.18	40
WTC NB thru/right	B	17.8	0.19	9
WTC SB left	D	45.4	0.22	37
WTC SB thru/right	A	0.0	0.02	0
<b>Seaport Boulevard/Boston Wharf Road</b>	<b>A</b>	<b>5.9</b>		
Seaport EB thru   thru/right	A	2.0	0.35	m57
Seaport WB left	B	10.3	0.17	m34
Seaport WB thru   thru	A	6.1	0.26	171
Boston Wharf NB left   left/right	D	46.1	0.30	33
<b>New Chardon Street/Merrimac Street</b>	<b>E</b>	<b>65.9</b>		
New Chardon EB left/thru   thru/right	A	6.4	0.41	6
New Chardon WB hard left	F	115.6	1.08	#321
New Chardon WB left/thru   thru/right	F	122.1	1.08	#329
Merrimac NB hard left/left	F	85.3	1.09	m#576
Merrimac NB thru   thru	C	20.0	0.46	m81
Merrimac NB right	A	4.0	0.21	m26
Merrimac SB left/thru   thru   thru/right	D	41.9	0.72	98

Table 12. Phase 2 Intersection Operations, Mid-day Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Valenti Way/North Washington Street</b>	<b>B</b>	<b>12.5</b>		
N. Washington NB left	C	25.7	0.26	68
N. Washington NB thru   thru/right	B	10.4	0.35	142
N. Washington SB left/thru   thru   thru/right	B	12.8	0.70	208
<b>Summer Street/West Side Drive</b>	<b>A</b>	<b>8.6</b>		
Summer EB thru   thru/right	B	10.5	0.20	178
Summer WB left	A	4.5	0.04	6
Summer WB thru   thru	A	3.3	0.13	34
West Side NB left	D	37.0	0.11	19
West Side NB right	B	14.0	0.23	6
<b>Summer Street/WTC Avenue</b>	<b>A</b>	<b>4.7</b>		
Summer EB left	A	1.4	0.05	3
Summer EB thru   thru	A	1.3	0.20	8
Summer EB right	A	0.1	0.06	0
Summer WB left	A	6.6	0.09	m24
Summer WB thru   thru/right	A	4.9	0.13	54
WTC NB left	D	41.6	0.25	23
WTC NB thru/right	A	0.2	0.07	0
WTC SB left	D	39.8	0.16	31
WTC SB thru/right	A	0.1	0.03	0
<b>Seaport Boulevard/Boston Wharf Road</b>	<b>A</b>	<b>5.5</b>		
Seaport EB thru   thru/right	A	5.0	0.23	91
Seaport WB left	A	3.5	0.24	22
Seaport WB thru   thru	A	2.2	0.14	m34
Boston Wharf NB left   left/right	C	20.2	0.34	29
<b>New Chardon Street/Merrimac Street</b>	<b>C</b>	<b>29.3</b>		
New Chardon EB left/thru   thru/right	A	7.4	0.51	11
New Chardon WB hard left	F	81.9	0.90	#186
New Chardon WB left/thru   thru/right	D	46.0	0.87	#104
Merrimac NB hard left/left	C	31.2	0.80	#374
Merrimac NB thru   thru	B	15.9	0.30	66
Merrimac NB right	A	5.3	0.18	26
Merrimac SB left/thru   thru   thru/right	C	33.8	0.64	90

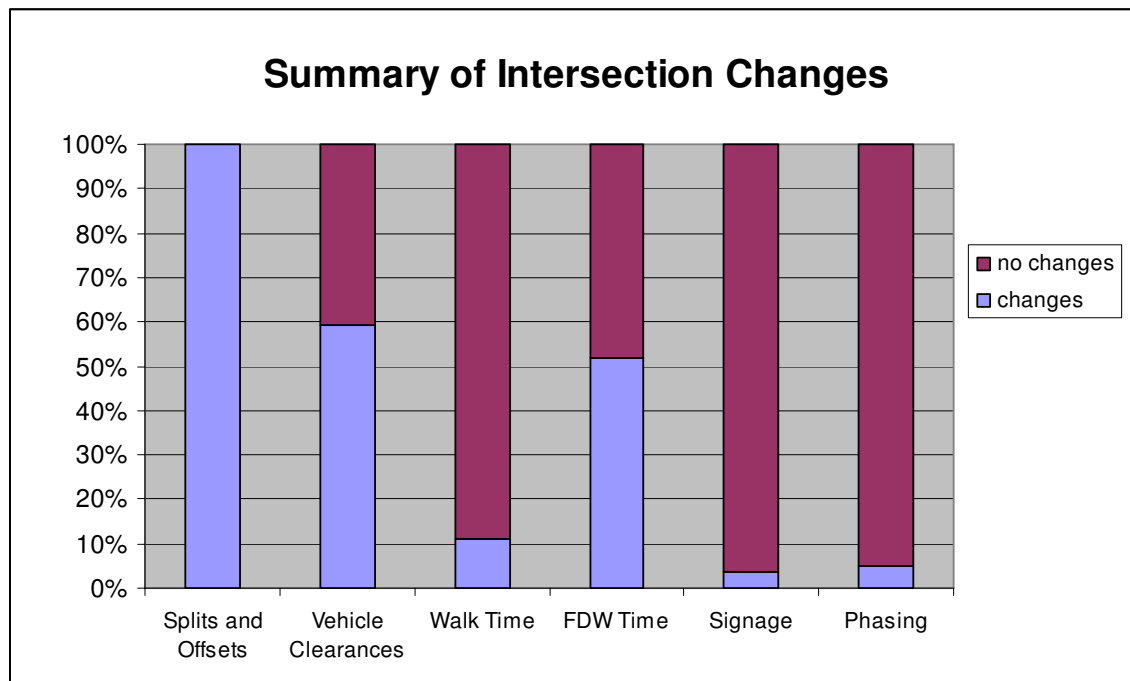
Table 13. Phase 2 Intersection Operations, p.m. Peak Hour

Intersection Approach	LOS	Delay (sec./veh.)	v/c Ratio	95% Queue Length (feet)
<b>Valenti Way/North Washington Street</b>	<b>C</b>	<b>27.5</b>		
N. Washington NB left	F	132.0	1.07	#353
N. Washington NB thru   thru/right	B	10.4	0.45	186
N. Washington SB left/thru   thru   thru/right	B	13.7	0.78	363
<b>Summer Street/West Side Drive</b>	<b>A</b>	<b>8.0</b>		
Summer EB thru   thru/right	A	8.9	0.34	291
Summer WB left	A	5.8	0.10	4
Summer WB thru   thru	A	4.0	0.20	44
West Side NB left	D	41.8	0.11	30
West Side NB right	B	15.4	0.24	11
<b>Summer Street/WTC Avenue</b>	<b>A</b>	<b>5.6</b>		
Summer EB left	A	1.2	0.06	2
Summer EB thru   thru	A	1.1	0.30	11
Summer EB right	A	0.3	0.14	0
Summer WB left	A	8.6	0.24	m54
Summer WB thru   thru/right	A	5.5	0.18	85
WTC NB left	D	46.6	0.31	49
WTC NB thru/right	A	0.4	0.12	0
WTC SB left	D	47.0	0.30	43
WTC SB thru/right	B	19.	0.14	0
<b>Seaport Boulevard/Boston Wharf Road</b>	<b>B</b>	<b>10.9</b>		
Seaport EB thru   thru/right	A	7.3	0.21	79
Seaport WB left	A	5.0	0.21	m27
Seaport WB thru   thru	A	4.0	0.37	80
Boston Wharf NB left   left/right	D	46.7	0.54	87
<b>New Chardon Street/Merrimac Street</b>	<b>E</b>	<b>60.2</b>		
New Chardon EB left/thru   thru/right	A	6.9	0.65	8
New Chardon WB hard left	E	67.6	0.89	#260
New Chardon WB left/thru   thru/right	D	53.6	0.90	#123
Merrimac NB hard left/left	D	50.0	0.94	m#335
Merrimac NB thru   thru	B	16.9	0.42	m72
Merrimac NB right	E	63.1	0.60	m319
Merrimac SB left (de facto)	F	209.4	0.98	#298
Merrimac SB thru   thru/right	C	30.3	0.49	107

### *Summary of Intersection Improvements*

Of the 81 study area locations, changes have been made to all of them to improve operations. **Figure 5** shows a summary of all the changes made to improve the network.

Figure 5. Intersection Improvements



As shown in the above figure, splits and offsets were adjusted for all of the intersections. Vehicle clearances were adjusted for about 60%, walk times for 11%, FDW times for 52%, signage for 4% and phasing for 6% of the locations. A list showing the signal changes made at each intersection can be found in **Appendix E**.

## Corridor Measures of Effectiveness

Synchro allows for the output of delay, fuel consumption, emissions, and other details for multiple intersections located within the same corridor. The formulas used to calculate fuel consumption are the same as the default formulas in TRANSYT-7F and the emissions formulas are based on fuel consumption rates determined by the Oak Ridge National Laboratory. Corridor Measures of Effectiveness comparisons between Existing Conditions and Phase 1 Improvements can be seen in **Table 14** through **Table 25**.

**Table 14. Synchro Detailed Measures of Effectiveness Comparison  
Atlantic Avenue/Cross Street**

	Existing	Phase 1	
			% Change from Existing
<b><i>a.m. Peak Hour</i></b>			
Total Delay (hr.)	127	87	-47.2%
Stops/vehicle	0.52	0.41	-21.2%
Average Speed (mph)	7	11	+57.1%
Fuel Consumed (gal.)	192	136	-29.2%
Fuel Economy (mpg)	6.4	8.9	+39.1%
CO Emissions (kg)	13.40	9.5	-29.1%
NOx Emissions (kg)	2.61	1.85	-29.1%
VOC Emissions (kg)	3.10	2.20	-29.0%
<b><i>Mid-day Peak Hour</i></b>			
Total Delay (hr.)	51	38	-25.5%
Stops/vehicle	0.50	0.49	-2.0%
Average Speed (mph)	11	13	+18.2%
Fuel Consumed (gal.)	104	98	-5.7%
Fuel Economy (mpg)	8.2	9.1	+11.0%
CO Emissions (kg)	7.29	6.83	-6.3%
NOx Emissions (kg)	1.42	1.33	-6.3%
VOC Emissions (kg)	1.69	1.58	-5.3%
<b><i>p.m. Peak Hour</i></b>			
Total Delay (hr.)	60	67	+11.7%
Stops/vehicle	0.38	0.41	+7.9%
Average Speed (mph)	12	11	-8.3%
Fuel Consumed (gal.)	131	136	+3.8%
Fuel Economy (mpg)	9.5	8.9	-6.3%
CO Emissions (kg)	9.17	9.50	+3.6%
NOx Emissions (kg)	1.78	1.84	+3.4%
VOC Emissions (kg)	2.12	2.19	+3.3%

The Phase 1 Improvements are expected to decrease delays along Atlantic Avenue/Cross Street during the morning and mid-day peak by 47.2% and 25.5%, respectively. An increase of 11.7% during the evening peak hour expected. Generally, Atlantic Avenue operates pretty well during the even peak hour. Favor in progression was given to the Purchase Street corridor in the afternoon causing a slight increase in delay on Atlantic Avenue.

Yearly savings over the Phase 1 Improvements are expected to be a decrease of 47,800 hours of delay and save over 28,900 gallons of fuel. This will also prevent over 2 tons of CO from being emitted per year.

**Table 15. Synchro Detailed Measures of Effectiveness Comparison  
Surface Road/Purchase Street/SASB**

	Existing	Phase 1	
			% Change from Existing
<b>a.m. Peak Hour</b>			
Total Delay (hr.)	168	107	-36.3%
Stops/vehicle	0.48	0.47	-2.1%
Average Speed (mph)	6	9	+50.0%
Fuel Consumed (gal.)	230	190	-17.4%
Fuel Economy (mpg)	5.2	6.8	+30.8%
CO Emissions (kg)	16.05	13.28	-17.3%
NOx Emissions (kg)	3.12	2.58	-17.3%
VOC Emissions (kg)	3.72	3.08	-17.2%
<b>Mid-day Peak Hour</b>			
Total Delay (hr.)	79	56	-29.1%
Stops/vehicle	0.53	0.41	-22.6%
Average Speed (mph)	9	12	+33.3%
Fuel Consumed (gal.)	145	122	-15.9%
Fuel Economy (mpg)	6.6	8.6	+30.3%
CO Emissions (kg)	10.14	8.87	-12.5%
NOx Emissions (kg)	1.97	1.73	-12.2%
VOC Emissions (kg)	2.35	2.06	-12.3%
<b>p.m. Peak Hour</b>			
Total Delay (hr.)	113	106	-6.2%
Stops/vehicle	0.48	0.47	-2.1%
Average Speed (mph)	8	9	+12.5%
Fuel Consumed (gal.)	198	190	-4.0%
Fuel Economy (mpg)	6.7	6.8	+1.5%
CO Emissions (kg)	13.81	13.25	-4.1%
NOx Emissions (kg)	2.69	2.58	-4.1%
VOC Emissions (kg)	3.20	3.07	-4.1%

The Phase 1 Improvements are expected to decrease by over delays along Surface Road/Purchase Street/SASB by 30% during the morning and mid-day peak hours. Phase 1 improvements are also expected to slightly decrease delay during the evening peak hour.

Phase 1 Improvements are expected to save 77,500 hours of delay yearly and save over 72,000 gallons of fuel. This will also prevent 4.5 tons of CO from being emitted per year.



**Table 16. Synchro Detailed Measures of Effectiveness Comparison  
Kneeland Street**

	Existing	Phase 1	
			% Change from Existing
<b>a.m. Peak Hour</b>			
Total Delay (hr.)	51	29	-43.1%
Stops/vehicle	0.88	0.73	-17.0%
Average Speed (mph)	4	6	+50%
Fuel Consumed (gal.)	60	41	-3.7%
Fuel Economy (mpg)	3.4	4.8	+41.2%
CO Emissions (kg)	4.22	2.84	-32.7%
NOx Emissions (kg)	0.82	0.55	-33.0%
VOC Emissions (kg)	0.97	0.66	-32.0%
<b>Mid-day Peak Hour</b>			
Total Delay (hr.)	47	23	-51.0%
Stops/vehicle	0.77	0.75	-2.6%
Average Speed (mph)	3	6	+100.0%
Fuel Consumed (gal.)	53	35	-34.0%
Fuel Economy (mpg)	3.3	5.0	+51.5%
CO Emissions (kg)	3.70	2.46	-33.5%
NOx Emissions (kg)	0.72	0.48	-33.3%
VOC Emissions (kg)	0.86	0.57	-33.7%
<b>p.m. Peak Hour</b>			
Total Delay (hr.)	45	29	-35.6%
Stops/vehicle	0.74	0.73	-1.4%
Average Speed (mph)	4	6	+50.0%
Fuel Consumed (gal.)	53	41	-22.6%
Fuel Economy (mpg)	3.7	4.8	+29.7%
CO Emissions (kg)	3.72	2.84	-23.7%
NOx Emissions (kg)	0.72	0.55	-23.6%
VOC Emissions (kg)	0.86	0.66	-23.3%

The Phase 1 Improvements are expected to decrease delays by over 30% along Kneeland Street during all peak hours.

Yearly savings over the Phase 1 Improvements are expected to be over 72,000 hours of delay and 54,800 gallons of fuel. This will also prevent over 4 tons of CO from being emitted per year.

**Table 17. Synchro Detailed Measures of Effectiveness Comparison  
Congress Street/Merrimac Street**

	Existing	Phase 1	
			% Change from Existing
<b>a.m. Peak Hour</b>			
Total Delay (hr.)	70	59	-15.7%
Stops/vehicle	0.61	0.51	-16.4%
Average Speed (mph)	6	7	+16.7%
Fuel Consumed (gal.)	98	85	-7.1%
Fuel Economy (mpg)	5.2	6.0	+15.4%
CO Emissions (kg)	6.84	5.97	-16.1%
NOx Emissions (kg)	1.33	1.16	-12.8%
VOC Emissions (kg)	1.59	1.38	-13.2%
<b>Mid-day Peak Hour</b>			
Total Delay (hr.)	41	33	-19.5%
Stops/vehicle	0.62	0.48	-22.6%
Average Speed (mph)	7	9	+28.6%
Fuel Consumed (gal.)	66	56	-15.2%
Fuel Economy (mpg)	6.0	7.0	+16.7%
CO Emissions (kg)	4.65	3.90	-16.1%
NOx Emissions (kg)	0.89	0.76	-14.6%
VOC Emissions (kg)	1.07	0.90	-15.9%
<b>p.m. Peak Hour</b>			
Total Delay (hr.)	48	59	+23.0%
Stops/vehicle	0.48	0.54	+12.5%
Average Speed (mph)	8	7	-12.5%
Fuel Consumed (gal.)	77	88	+14.3%
Fuel Economy (mpg)	6.8	5.9	-13.2%
CO Emissions (kg)	5.41	6.15	+13.7%
NOx Emissions (kg)	1.05	1.20	+14.3%
VOC Emissions (kg)	1.25	1.42	+13.6%

The Phase 1 Improvements are expected to decrease delay along the downtown section of Congress Street/Merrimac Street during the morning and mid-day peak hour. Delay is expected to increase by 23% during the evening peak hour.

Phase 1 Improvements are expected to save 20,800 hours of delay and over 26,000 gallons of fuel yearly. This will also prevent over 2 tons of CO from being emitted per year.

**Table 18. Synchro Detailed Measures of Effectiveness Comparison  
North Street**

	Existing	Phase 1	
			% Change from Existing
<b>a.m. Peak Hour</b>			
Total Delay (hr.)	21	32	+52.4%
Stops/vehicle	0.69	0.68	-1.5%
Average Speed (mph)	5	4	-20.0%
Fuel Consumed (gal.)	32	40	+25.0%
Fuel Economy (mpg)	4.0	3.2	-20.0%
CO Emissions (kg)	2.22	2.76	+23.9%
NOx Emissions (kg)	0.43	0.54	+25.6%
VOC Emissions (kg)	0.51	0.64	+25.5%
<b>Mid-day Peak Hour</b>			
Total Delay (hr.)	18	9	-50.0%
Stops/vehicle	0.78	0.62	-20.5%
Average Speed (mph)	4	8	+50.0%
Fuel Consumed (gal.)	26	17	-34.6%
Fuel Economy (mpg)	3.5	5.3	+51.4%
CO Emissions (kg)	1.82	1.21	-33.5%
NOx Emissions (kg)	0.35	0.24	-31.4%
VOC Emissions (kg)	0.42	0.28	-33.3%
<b>p.m. Peak Hour</b>			
Total Delay (hr.)	12	12	No Change
Stops/vehicle	0.69	0.46	-33.3%
Average Speed (mph)	6	6	No Change
Fuel Consumed (gal.)	21	18	-14.3%
Fuel Economy (mpg)	4.5	5.2	+15.6%
CO Emissions (kg)	1.43	1.26	-11.9%
NOx Emissions (kg)	0.28	0.24	-14.3%
VOC Emissions (kg)	0.33	0.29	-12.1%

The Phase 1 Improvements are expected to increase delays along North Street the morning peak hour, decrease during the mid-day peak hour, and have no change in the evening peak.

Yearly savings over the Phase 1 Improvements are expected to save 20,500 hours of delay and 22,000 gallons of fuel. This will also prevent over 1 ton of CO from being emitted per year.

**Table 19. Synchro Detailed Measures of Effectiveness Comparison  
Summer Street (South Boston)**

	Existing	Phase 1	
			% Change from Existing
<b>a.m. Peak Hour</b>			
Total Delay (hr.)	41	38	-7.3%
Stops/vehicle	0.55	0.46	-16.4%
Average Speed (mph)	14	14	No Change
Fuel Consumed (gal.)	96	90	-6.3%
Fuel Economy (mpg)	10.8	11.6	+7.4%
CO Emissions (kg)	6.72	6.33	-5.4%
NOx Emissions (kg)	1.31	1.22	-6.7%
VOC Emissions (kg)	1.56	1.46	-6.4%
<b>Mid-day Peak Hour</b>			
Total Delay (hr.)	25	19	-24.0%
Stops/vehicle	0.49	0.46	-6.1%
Average Speed (mph)	16	18	+12.5%
Fuel Consumed (gal.)	68	62	-8.8%
Fuel Economy (mpg)	12.1	13.2	+9.1%
CO Emissions (kg)	4.76	4.36	-8.4%
NOx Emissions (kg)	0.93	0.85	-8.6%
VOC Emissions (kg)	1.10	1.01	-8.2%
<b>p.m. Peak Hour</b>			
Total Delay (hr.)	30	27	-10.0%
Stops/vehicle	0.54	0.49	-9.3%
Average Speed (mph)	16	17	+6.3%
Fuel Consumed (gal.)	85	80	-5.9%
Fuel Economy (mpg)	11.9	12.6	+5.9%
CO Emissions (kg)	5.92	5.61	-5.2%
NOx Emissions (kg)	1.15	1.09	-5.2%
VOC Emissions (kg)	1.37	1.30	-5.1%

The Phase 1 Improvements are expected to decrease delays along Summer Street in South Boston during all peak hours.

Phase 1 Improvements are expected to save 17,000 hours of delay and nearly 18,500 gallons of fuel annually. This will also prevent over 1 ton of CO from being emitted per year.

Table 20. Synchro Detailed Measures of Effectiveness Comparison  
Congress Street (South Boston)

	Existing	Phase 1	
			% Change from Existing
<b>a.m. Peak Hour</b>			
Total Delay (hr.)	15	36	+140.0%
Stops/vehicle	0.49	0.71	+44.9%
Average Speed (mph)	15	11	-26.7%
Fuel Consumed (gal.)	38	69	+81.6%
Fuel Economy (mpg)	11.4	8.7	-23.7%
CO Emissions (kg)	2.67	4.84	+81.3%
NOx Emissions (kg)	0.52	0.94	+80.8%
VOC Emissions (kg)	0.62	1.12	+80.6%
<b>Mid-day Peak Hour</b>			
Total Delay (hr.)	9	16	+77.8%
Stops/vehicle	0.48	0.51	+6.3%
Average Speed (mph)	17	14	-17.6%
Fuel Consumed (gal.)	26	38	+46.1%
Fuel Economy (mpg)	12.6	11.4	-9.5%
CO Emissions (kg)	1.83	2.68	+46.4%
NOx Emissions (kg)	0.36	0.52	+44.4%
VOC Emissions (kg)	0.42	0.62	+47.6%
<b>p.m. Peak Hour</b>			
Total Delay (hr.)	25	27	+8.0%
Stops/vehicle	0.61	0.53	-13.1%
Average Speed (mph)	13	12	-7.7%
Fuel Consumed (gal.)	55	55	No Change
Fuel Economy (mpg)	10.1	10.1	No Change
CO Emissions (kg)	3.82	3.83	+2.6%
NOx Emissions (kg)	0.75	0.75	No Change
VOC Emissions (kg)	0.89	0.89	No Change

The Phase 1 Improvements are expected to increase delays greatly along Congress Street in the South Boston Waterfront neighborhood during the morning and mid-day peak, and increase slightly during the evening peak hour.

Table 21. Synchro Detailed Measures of Effectiveness Comparison  
D Street

	Existing	Phase 1	
			% Change from Existing
<b><i>a.m. Peak Hour</i></b>			
Total Delay (hr.)	22	17	-22.7%
Stops/vehicle	0.47	0.51	+8.5%
Average Speed (mph)	7	9	+28.6%
Fuel Consumed (gal.)	34	31	-8.8%
Fuel Economy (mpg)	6.4	6.9	+7.8%
CO Emissions (kg)	2.38	2.19	-8.0%
NOx Emissions (kg)	0.46	0.43	-6.5%
VOC Emissions (kg)	0.55	0.51	-7.3%
<b><i>Mid-day Peak Hour</i></b>			
Total Delay (hr.)	11	12	+9.1%
Stops/vehicle	0.43	0.49	+14.0%
Average Speed (mph)	10	10	No Change
Fuel Consumed (gal.)	21	22	+4.7%
Fuel Economy (mpg)	7.8	7.4	-5.1%
CO Emissions (kg)	1.49	1.56	+4.7%
NOx Emissions (kg)	0.29	0.30	+3.4%
VOC Emissions (kg)	0.35	0.36	+2.8%
<b><i>p.m. Peak Hour</i></b>			
Total Delay (hr.)	31	27	-12.9%
Stops/vehicle	0.58	0.50	-13.8%
Average Speed (mph)	7	8	+14.2%
Fuel Consumed (gal.)	51	46	-9.8%
Fuel Economy (mpg)	6.0	6.7	+11.7%
CO Emissions (kg)	3.57	3.20	-10.3%
NOx Emissions (kg)	0.70	0.62	-11.4%
VOC Emissions (kg)	0.83	0.74	-10.8%

The Phase 1 Improvements are expected to decrease delays slightly along D Street during the morning and evening peak, while increasing slightly during the mid-day peak.

**Table 22. Synchro Detailed Measures of Effectiveness Comparison  
Seaport Boulevard**

	Existing	Phase 1	
			% Change from Existing
<b><i>a.m. Peak Hour</i></b>			
Total Delay (hr.)	31	23	-25.8%
Stops/vehicle	0.55	0.50	-9.1%
Average Speed (mph)	13	15	+15.4%
Fuel Consumed (gal.)	68	59	-13.2%
Fuel Economy (mpg)	10.2	11.2	+9.8%
CO Emissions (kg)	4.75	4.12	-13.3%
NOx Emissions (kg)	0.92	0.80	-13.0%
VOC Emissions (kg)	1.10	0.95	-13.6%
<b><i>Mid-day Peak Hour</i></b>			
Total Delay (hr.)	17	22	+29.4%
Stops/vehicle	0.57	0.52	-8.8%
Average Speed (mph)	14	13	-7.1%
Fuel Consumed (gal.)	46	47	+2.2%
Fuel Economy (mpg)	10.4	10.0	-3.8%
CO Emissions (kg)	3.18	3.31	+4.1%
NOx Emissions (kg)	0.62	0.64	+3.2%
VOC Emissions (kg)	0.74	0.77	+4.1%
<b><i>p.m. Peak Hour</i></b>			
Total Delay (hr.)	23	27	+17.4%
Stops/vehicle	0.62	0.49	-20.9%
Average Speed (mph)	13	17	+30.7%
Fuel Consumed (gal.)	56	80	+42.9%
Fuel Economy (mpg)	9.7	12.6	+29.9%
CO Emissions (kg)	3.92	5.61	+43.1%
NOx Emissions (kg)	0.76	1.09	+43.4%
VOC Emissions (kg)	0.91	1.30	+42.9%

The Phase 1 Improvements are expected to decrease delays along Seaport Boulevard during the morning peak, and increase during the mid-day and evening peak hour.

With the implementation of Phase 2 improvements, Seaport Boulevard is expected to have more significant improvements in delay.

**Table 23. Synchro Detailed Measures of Effectiveness Comparison  
Albany Street**

	Existing	Phase 1	
			% Change from Existing
<b>a.m. Peak Hour</b>			
Total Delay (hr.)	23	22	-4.3%
Stops/vehicle	0.57	0.52	-8.8%
Average Speed (mph)	16	16	No Change
Fuel Consumed (gal.)	62	60	-3.2%
Fuel Economy (mpg)	11.8	12.1	+2.5%
CO Emissions (kg)	4.31	4.20	-2.6%
NOx Emissions (kg)	0.84	0.82	-2.4%
VOC Emissions (kg)	1.00	0.97	-3.0%
<b>Mid-day Peak Hour</b>			
Total Delay (hr.)	17	20	+17.6%
Stops/vehicle	0.52	0.57	+9.6%
Average Speed (mph)	16	15	-6.3%
Fuel Consumed (gal.)	48	55	+14.6%
Fuel Economy (mpg)	12.5	11.8	-5.6%
CO Emissions (kg)	3.38	3.82	+13.0%
NOx Emissions (kg)	0.66	0.74	+12.1%
VOC Emissions (kg)	0.78	0.88	+12.8%
<b>p.m. Peak Hour</b>			
Total Delay (hr.)	24	27	+4.2%
Stops/vehicle	0.51	0.56	+7.8%
Average Speed (mph)	16	15	-6.3%
Fuel Consumed (gal.)	64	69	+7.8%
Fuel Economy (mpg)	11.9	11.5	-3.4%
CO Emissions (kg)	4.51	4.86	+7.8%
NOx Emissions (kg)	0.88	0.94	+6.8%
VOC Emissions (kg)	1.02	1.13	+10.8%

The Phase 1 Improvements are expected to decrease delays slightly along Albany Street during the morning peak hour, but will increase slightly during the mid-day and evening peak hours.

Delays are expected to increase on southbound Albany Street in order to decrease delays on the side streets, including the Broadway Bridge, East Berkeley Street, and West Fourth Street. Increasing clearance times in order to improve safety is also expected to add to overall delays.



**Table 24. Synchro Detailed Measures of Effectiveness Comparison  
Frontage Road**

	Existing	Phase 1	
			% Change from Existing
<b>a.m. Peak Hour</b>			
Total Delay (hr.)	16	25	+56.3%
Stops/vehicle	0.59	0.67	+13.6%
Average Speed (mph)	14	11	-21.4%
Fuel Consumed (gal.)	40	48	+20.0%
Fuel Economy (mpg)	10.4	8.7	-16.3%
CO Emissions (kg)	2.79	3.34	+19.7%
NOx Emissions (kg)	0.54	0.65	+20.4%
VOC Emissions (kg)	0.65	0.77	+18.5%
<b>Mid-day Peak Hour</b>			
Total Delay (hr.)	12	14	+16.7%
Stops/vehicle	0.62	0.58	-6.5%
Average Speed (mph)	15	14	-6.7%
Fuel Consumed (gal.)	31	33	+6.5%
Fuel Economy (mpg)	10.7	10.7	No Change
CO Emissions (kg)	2.14	2.33	+8.9%
NOx Emissions (kg)	0.42	0.45	+7.1%
VOC Emissions (kg)	0.50	0.54	+7.4%
<b>p.m. Peak Hour</b>			
Total Delay (hr.)	15	23	+43.7%
Stops/vehicle	0.60	0.66	+10.0%
Average Speed (mph)	14	11	-21.4%
Fuel Consumed (gal.)	35	45	+28.6%
Fuel Economy (mpg)	10.5	8.9	-15.2%
CO Emissions (kg)	2.47	3.15	+27.5%
NOx Emissions (kg)	0.48	0.61	+27.1%
VOC Emissions (kg)	0.57	0.73	+28.1%

The Phase 1 Improvements are expected to increase delays along Frontage Road during all peak hours.

Delays are expected to increase on northbound Frontage Road in order to decrease delays on the side streets, including the Broadway Bridge, East Berkeley Street, and West Fourth Street. Increasing clearance times in order to improve safety is also expected to add to overall delays.

**Table 25. Synchro Detailed Measures of Effectiveness Comparison  
North Washington Street/Rutherford Avenue**

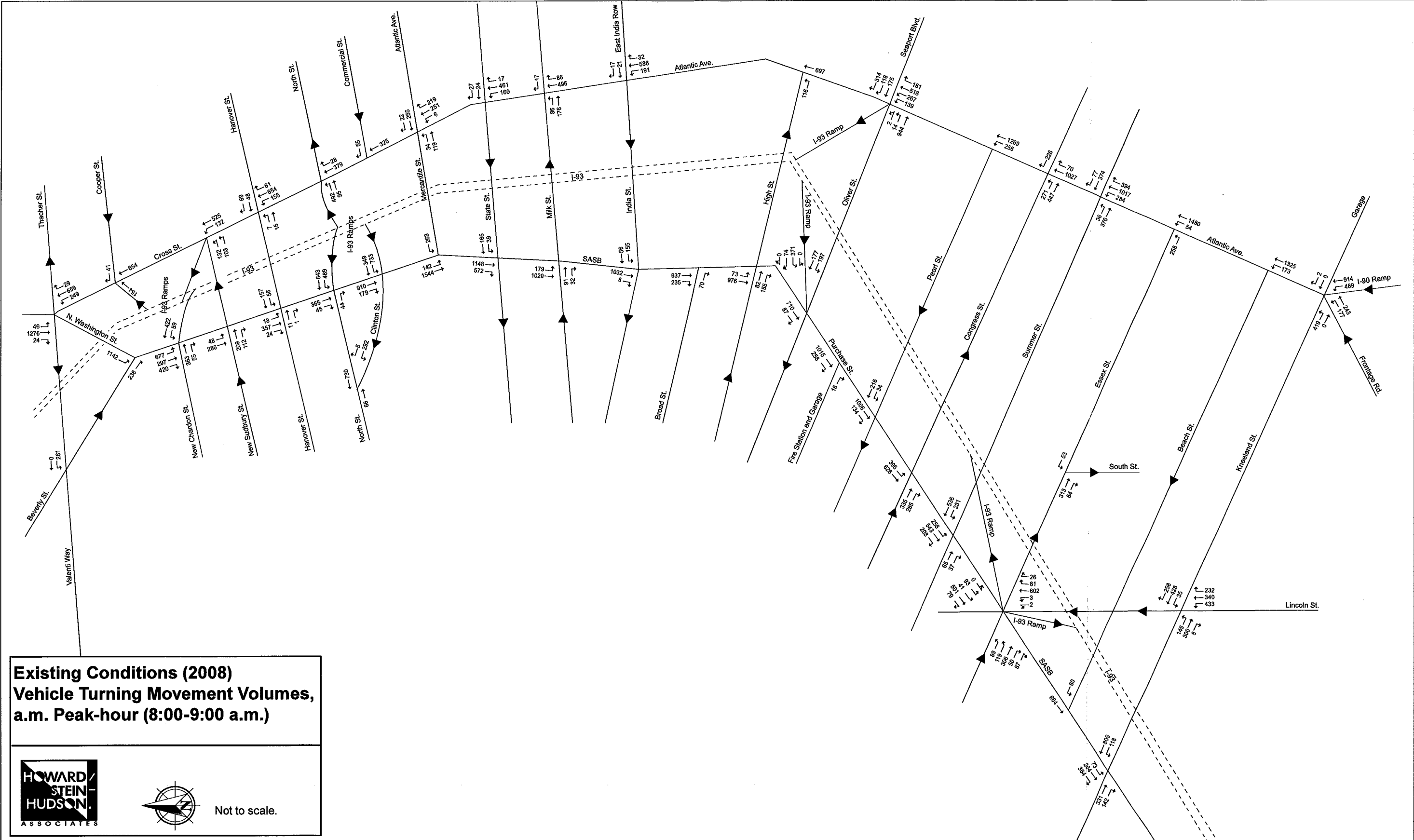
	Existing	Phase 1	
			% Change from Existing
<b>a.m. Peak Hour</b>			
Total Delay (hr.)	32	29	-9.4%
Stops/vehicle	0.45	0.47	+4.4%
Average Speed (mph)	14	14	No Change
Fuel Consumed (gal.)	70	68	-2.9%
Fuel Economy (mpg)	11.2	11.4	+1.8%
CO Emissions (kg)	4.87	4.78	-1.8%
NOx Emissions (kg)	0.95	0.93	-2.1%
VOC Emissions (kg)	1.13	1.11	-1.8%
<b>Mid-day Peak Hour</b>			
Total Delay (hr.)	34	24	-29.4%
Stops/vehicle	0.48	0.48	No Change
Average Speed (mph)	12	14	+14.3%
Fuel Consumed (gal.)	63	56	-11.1%
Fuel Economy (mpg)	10.0	11.2	+12.0%
CO Emissions (kg)	4.43	3.94	-11.1%
NOx Emissions (kg)	0.86	0.77	-10.4%
VOC Emissions (kg)	1.03	0.91	-11.7%
<b>p.m. Peak Hour</b>			
Total Delay (hr.)	51	34	-33.3%
Stops/vehicle	0.54	0.50	-7.4%
Average Speed (mph)	11	13	+18.2%
Fuel Consumed (gal.)	94	73	-22.3%
Fuel Economy (mpg)	9.5	10.7	+12.6%
CO Emissions (kg)	6.57	5.10	-22.4%
NOx Emissions (kg)	1.28	0.99	-22.7%
VOC Emissions (kg)	1.52	1.18	-22.4%

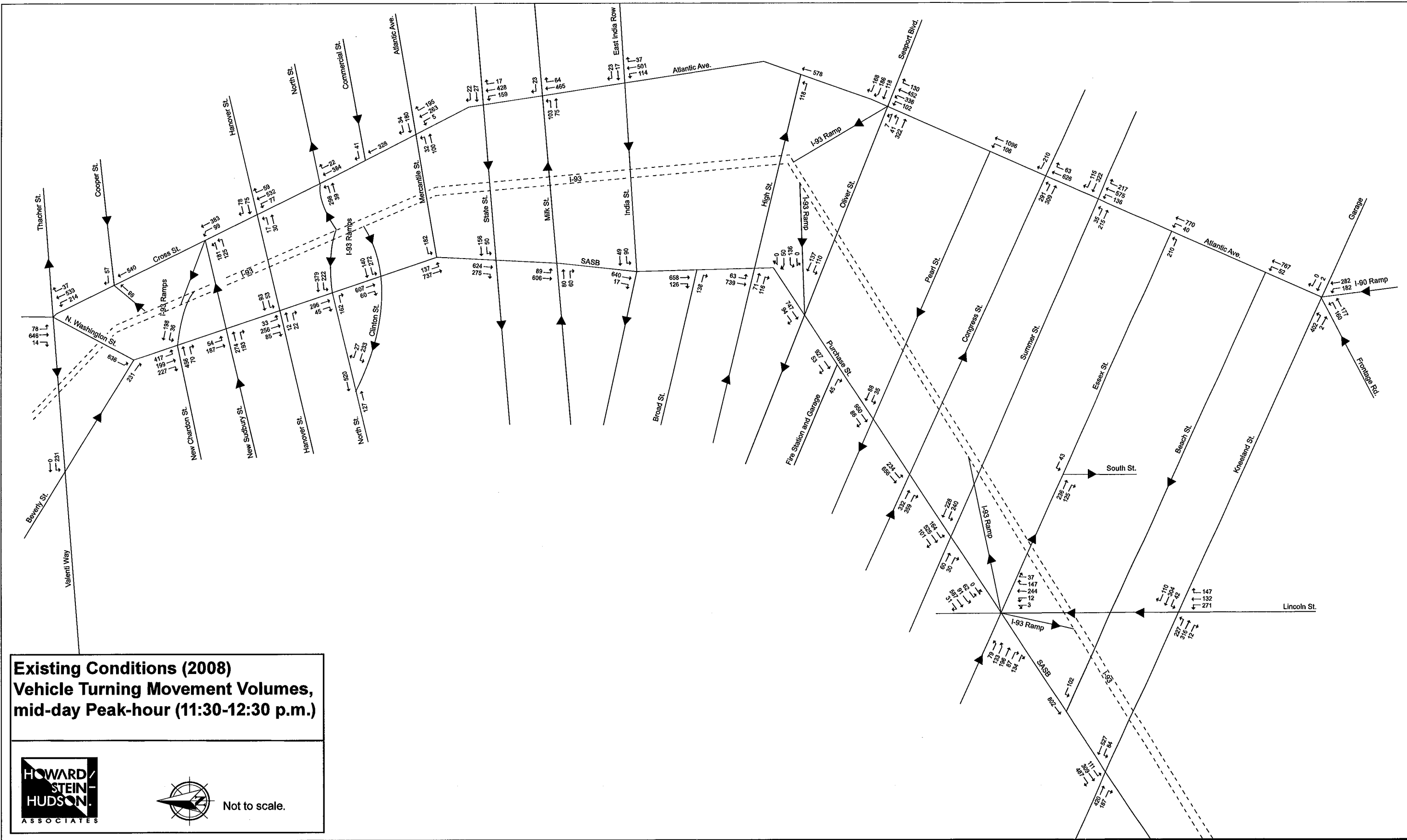
The Phase 1 Improvements are expected to decrease delays along North Washington Street/Rutherford Avenue during all peak hours.

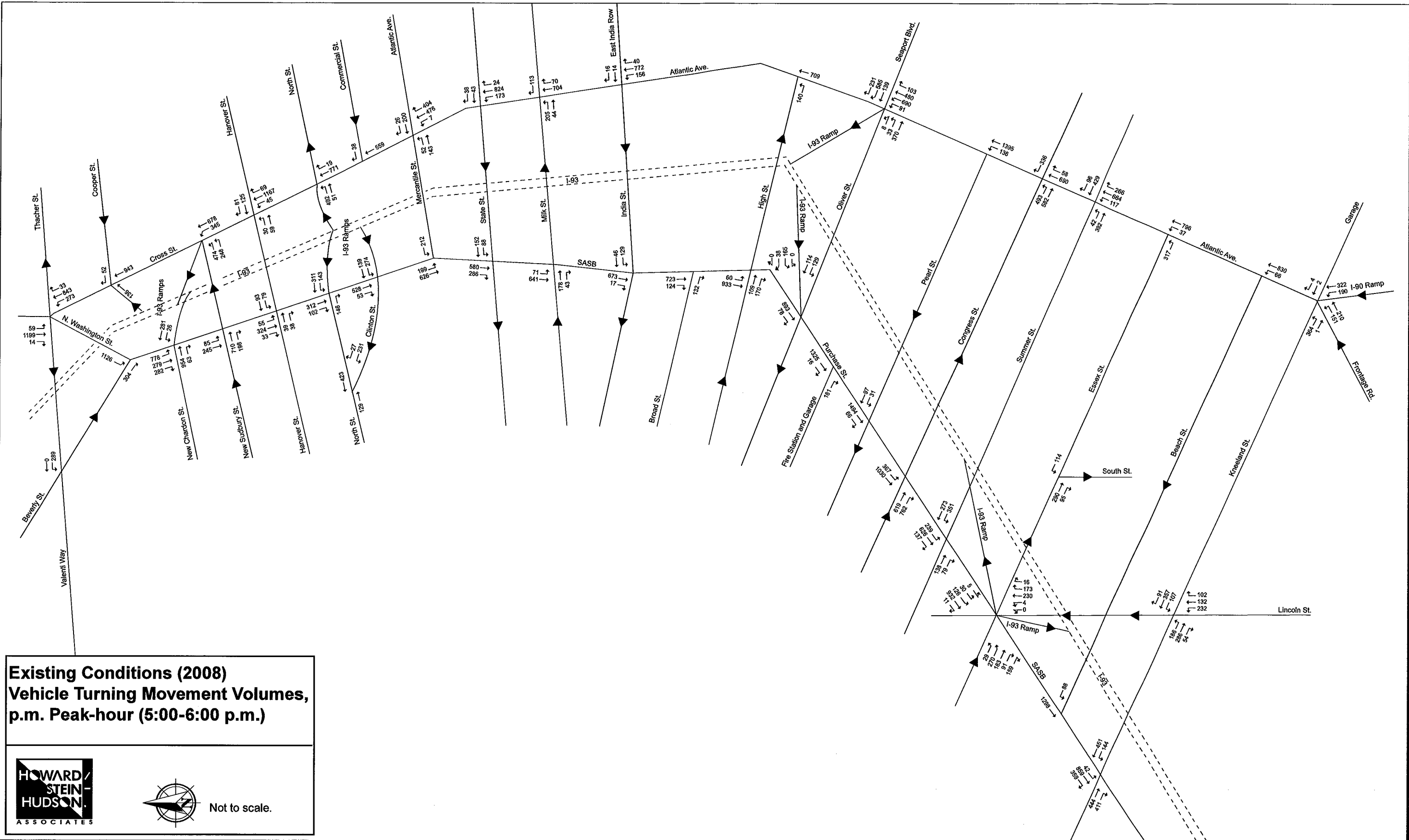
Yearly savings over the Phase 1 Improvements are expected to decrease by almost 32,000 hours of delay and 25,000 gallons of fuel. This will also prevent over 2 tons of CO from being emitted per year.

## Appendix A. Existing Turning Movement Diagrams

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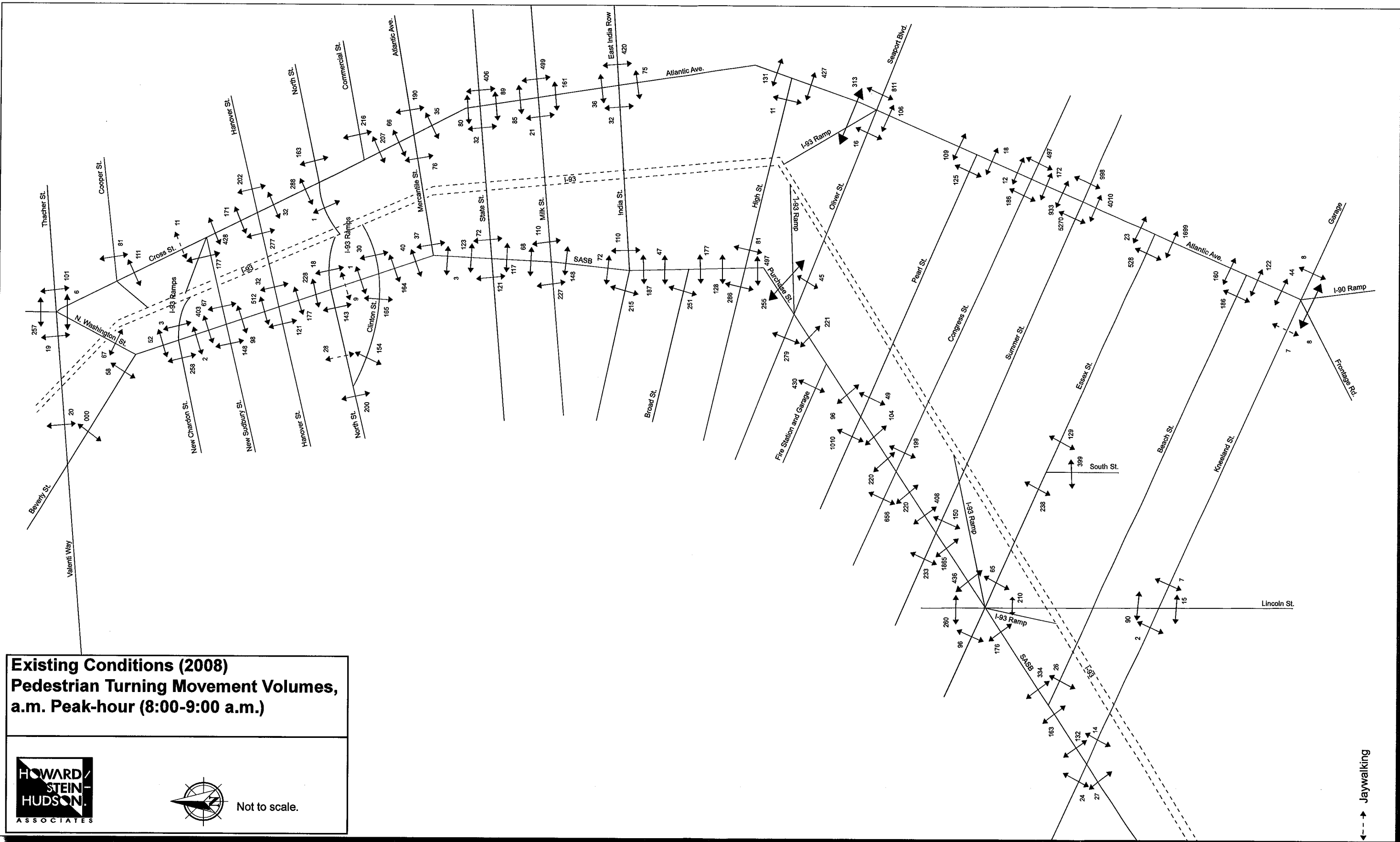


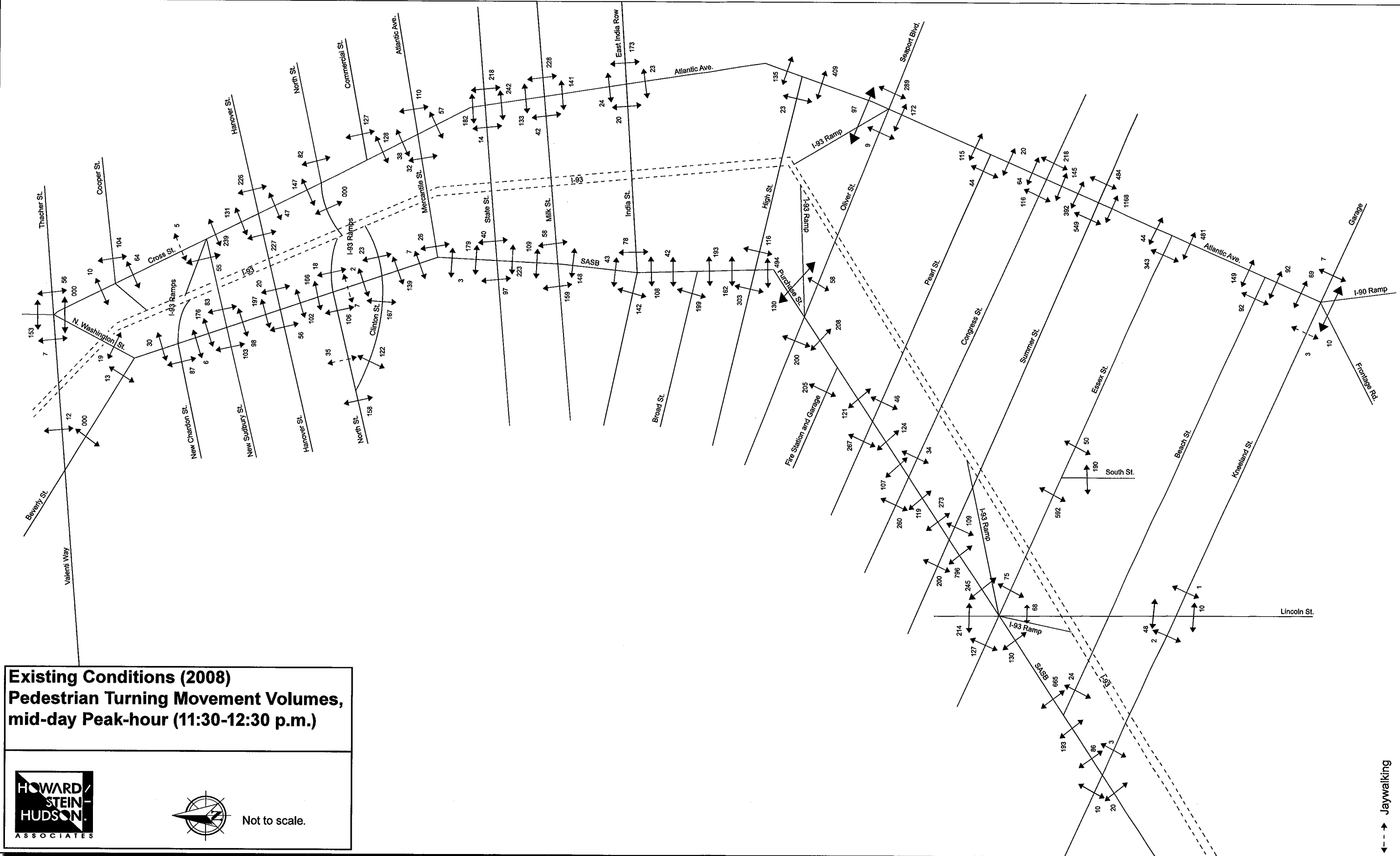


**Existing Conditions (2008)**  
**Vehicle Turning Movement Volumes,**  
**p.m. Peak-hour (5:00-6:00 p.m.)**

**HOWARD/STEIN-HUDSON ASSOCIATES**

Not to scale.



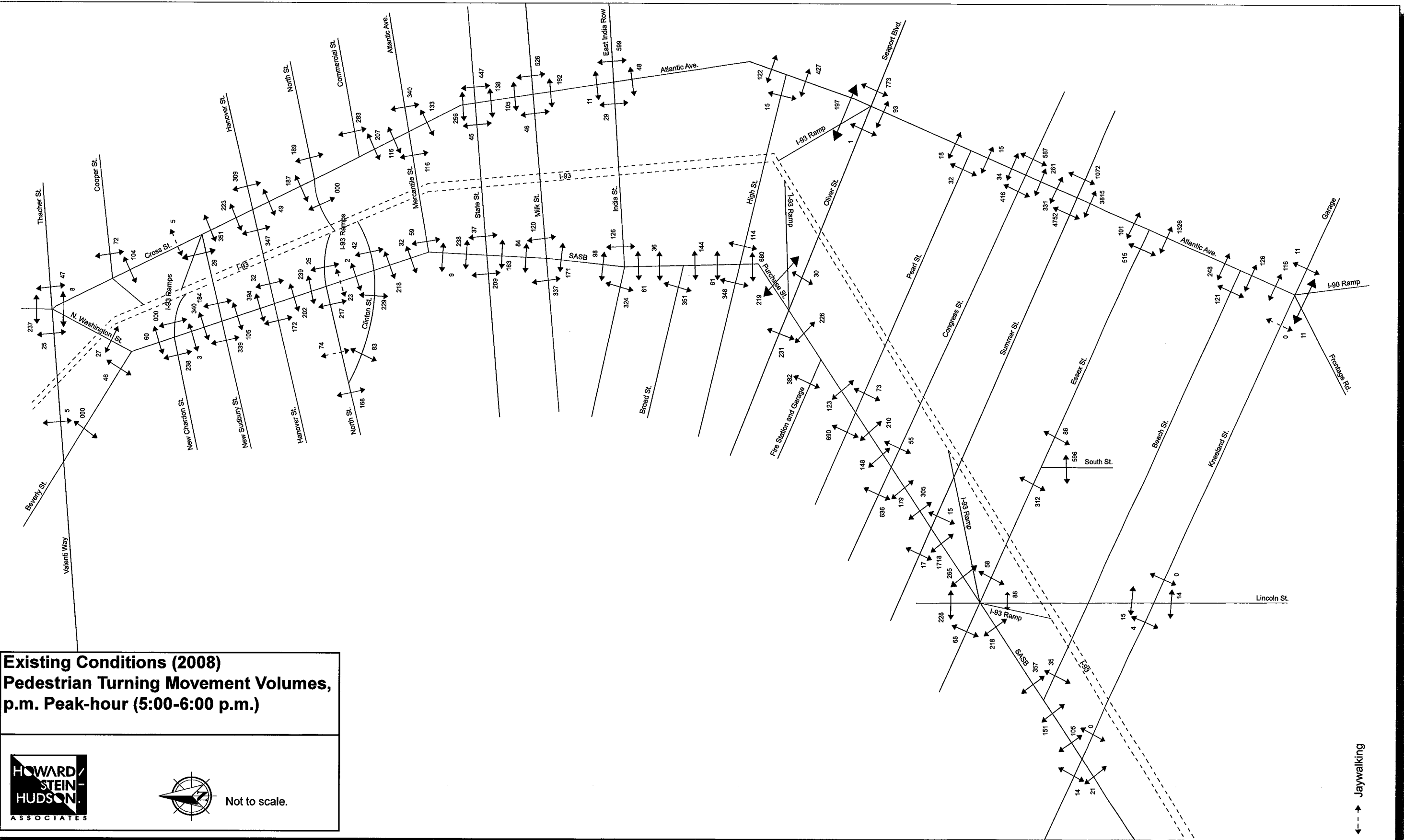


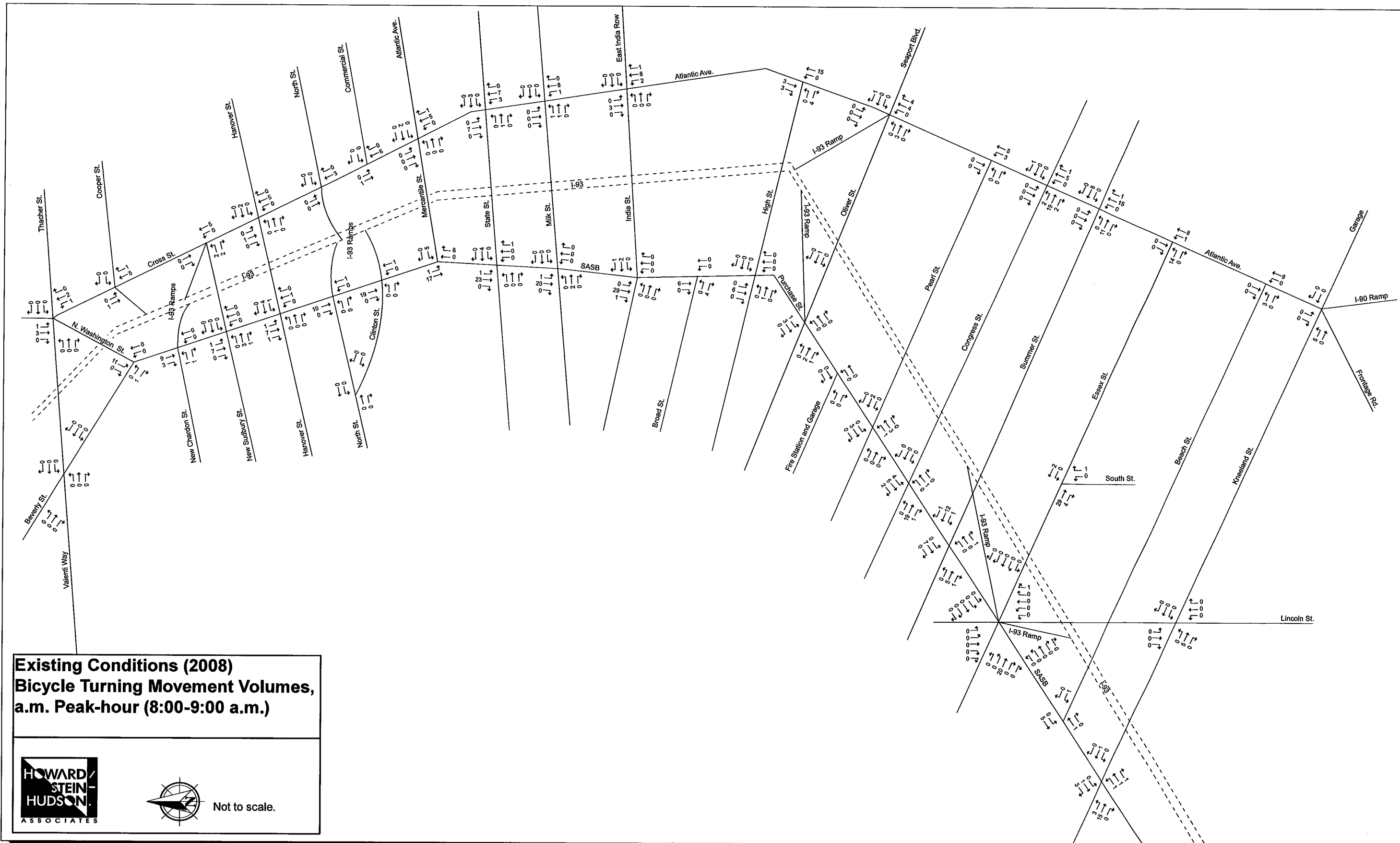
**Existing Conditions (2008)**  
**Pedestrian Turning Movement Volumes,**  
**mid-day Peak-hour (11:30-12:30 p.m.)**

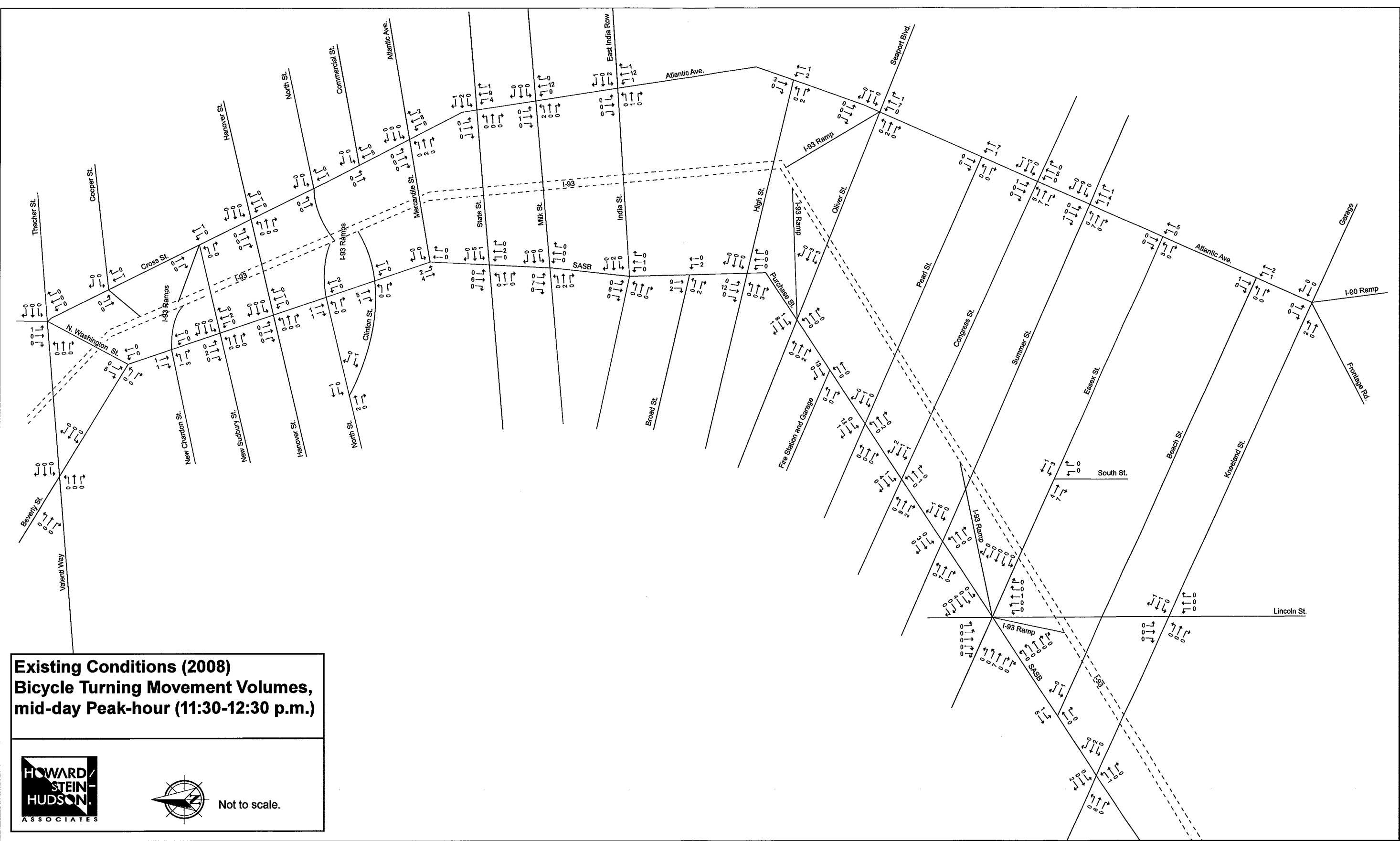
**HOWARD/STEIN-HUDSON ASSOCIATES**

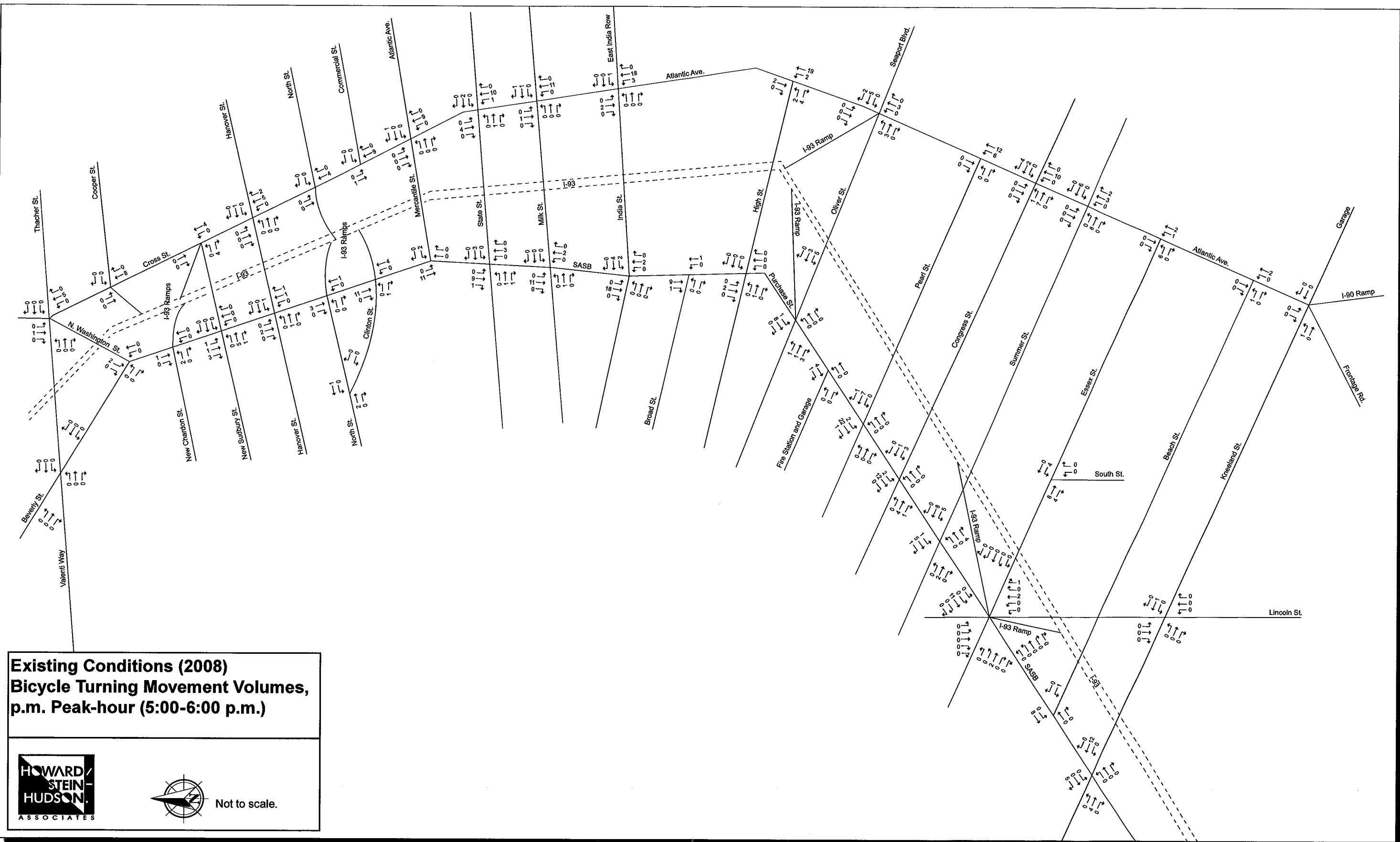
Not to scale.



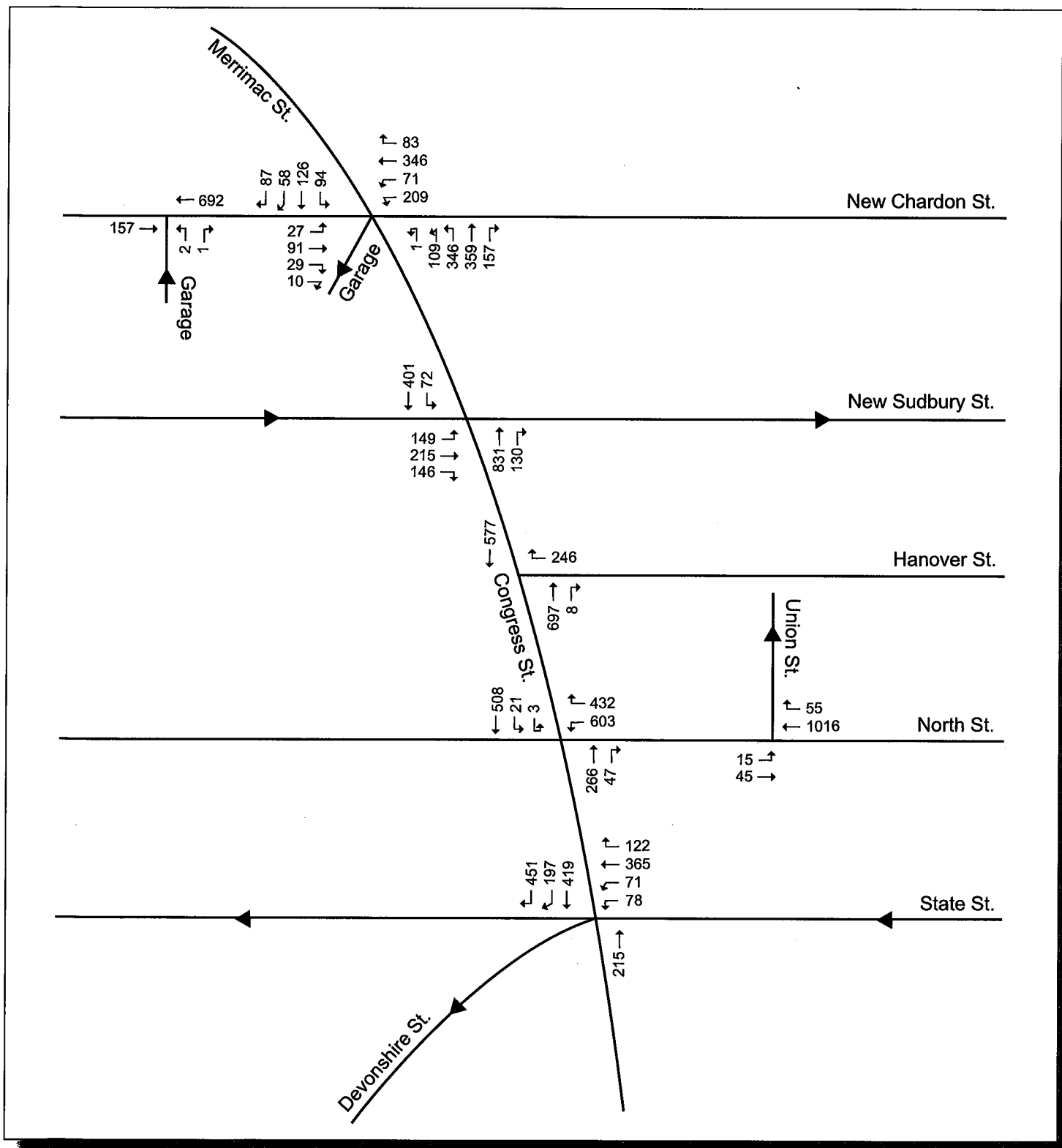






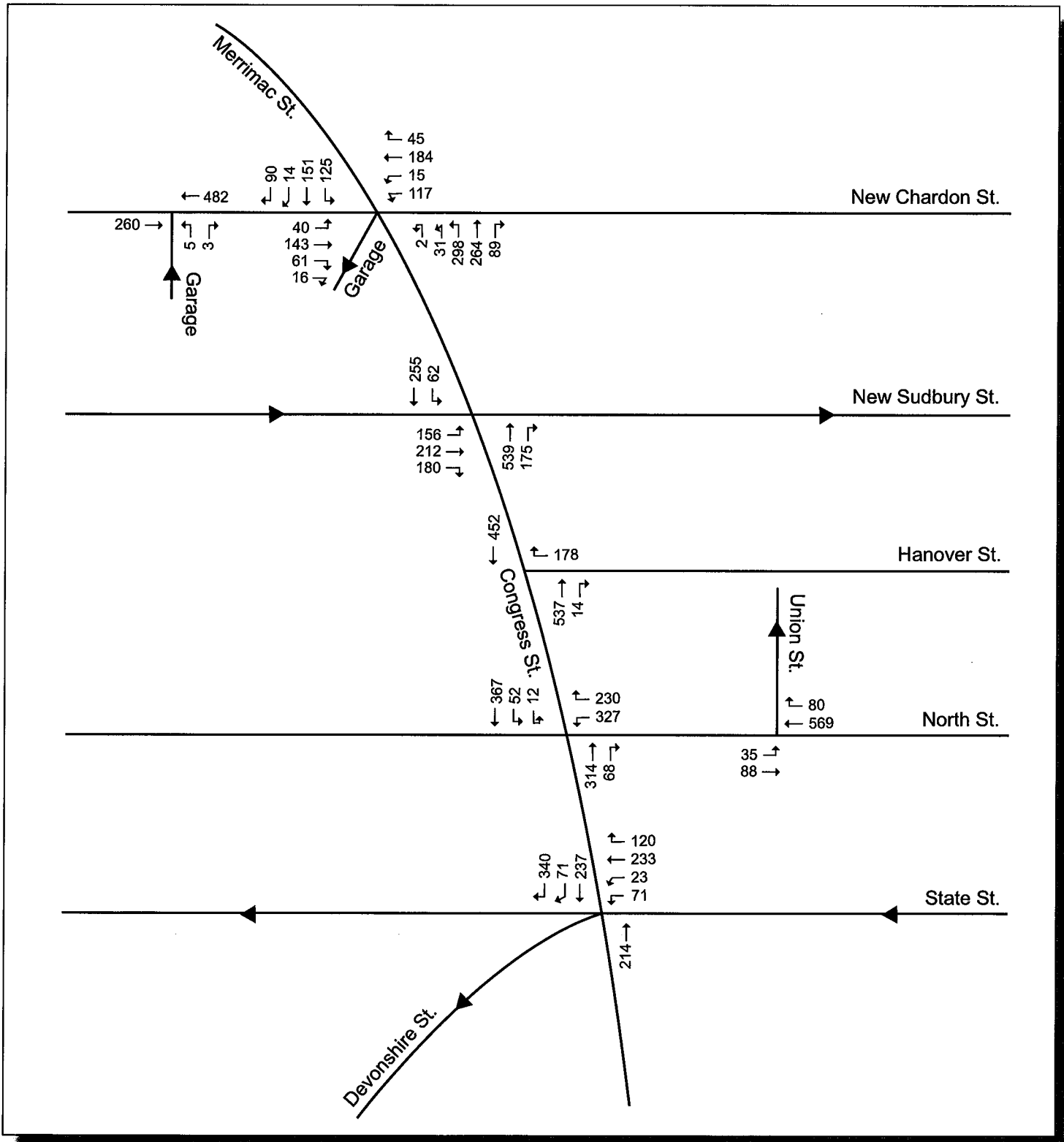


## Vehicle Turning Movement Volumes, a.m. Peak Hour (8:00–9:00 a.m.)



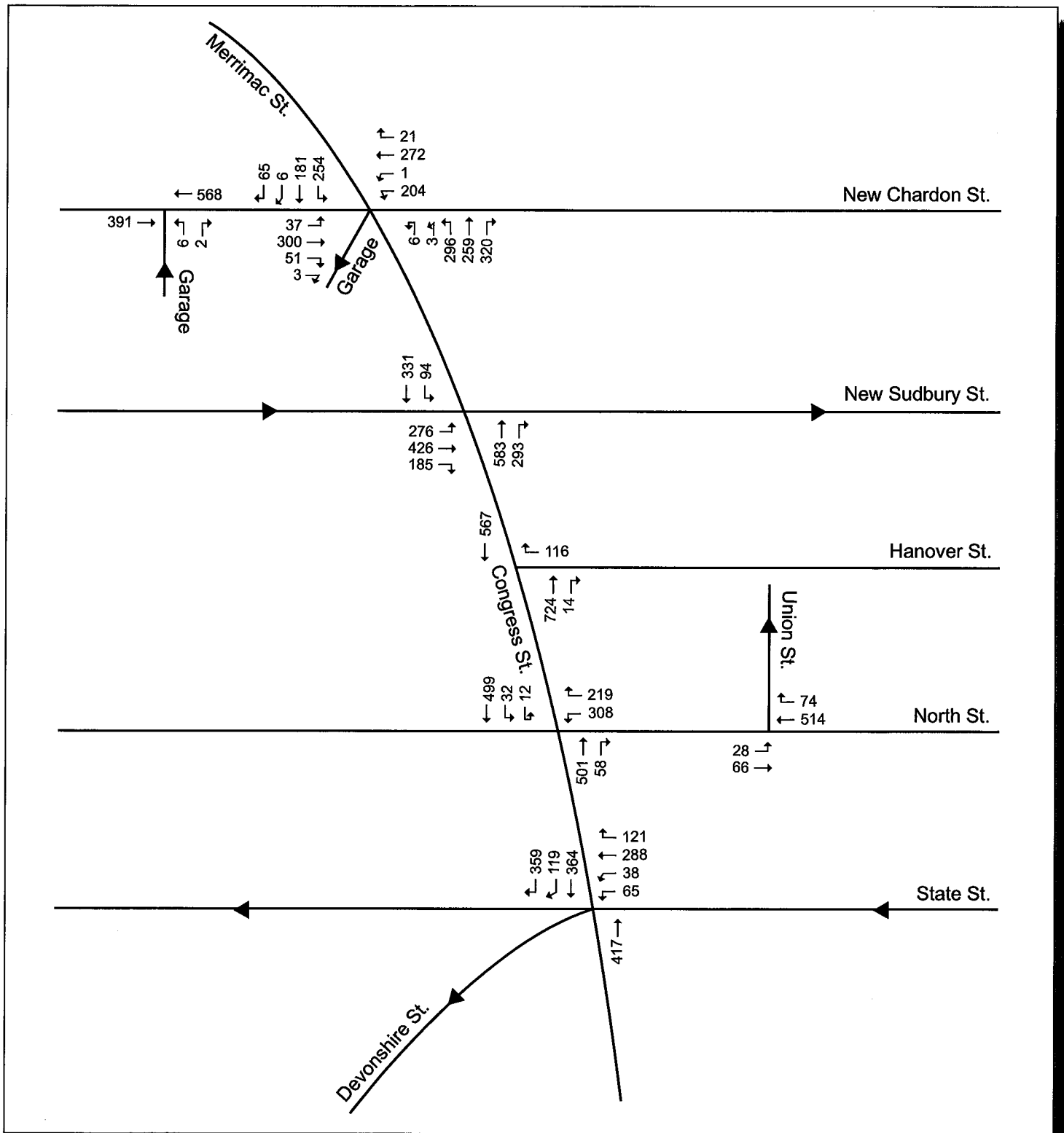
Not to scale.

## Vehicle Turning Movement Volumes, Mid-day Peak Hour (11:30 a.m.–12:30 p.m.)



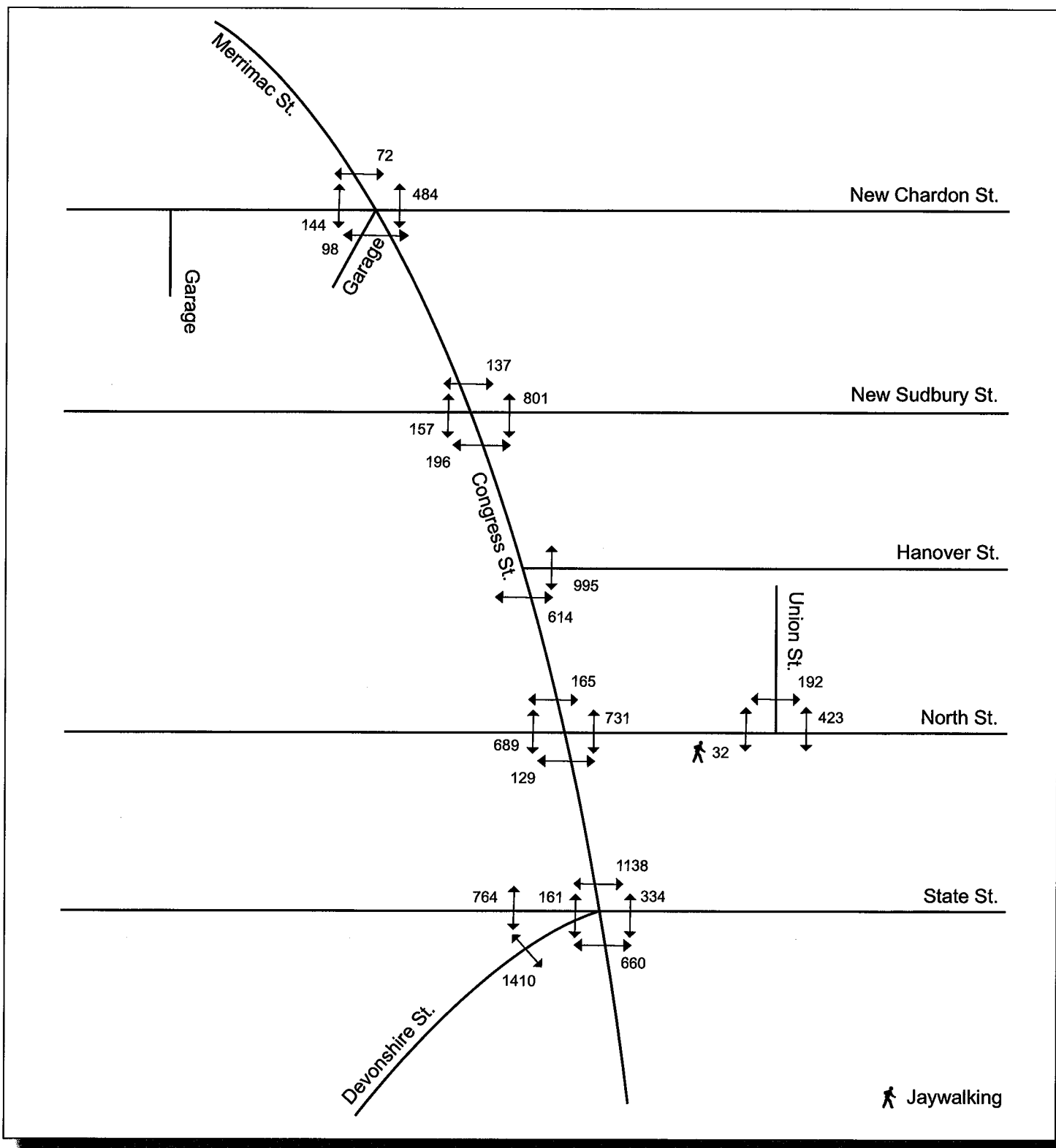
Not to scale.

## Vehicle Turning Movement Volumes, p.m. Peak Hour (5:00–6:00 p.m.)



Not to scale.

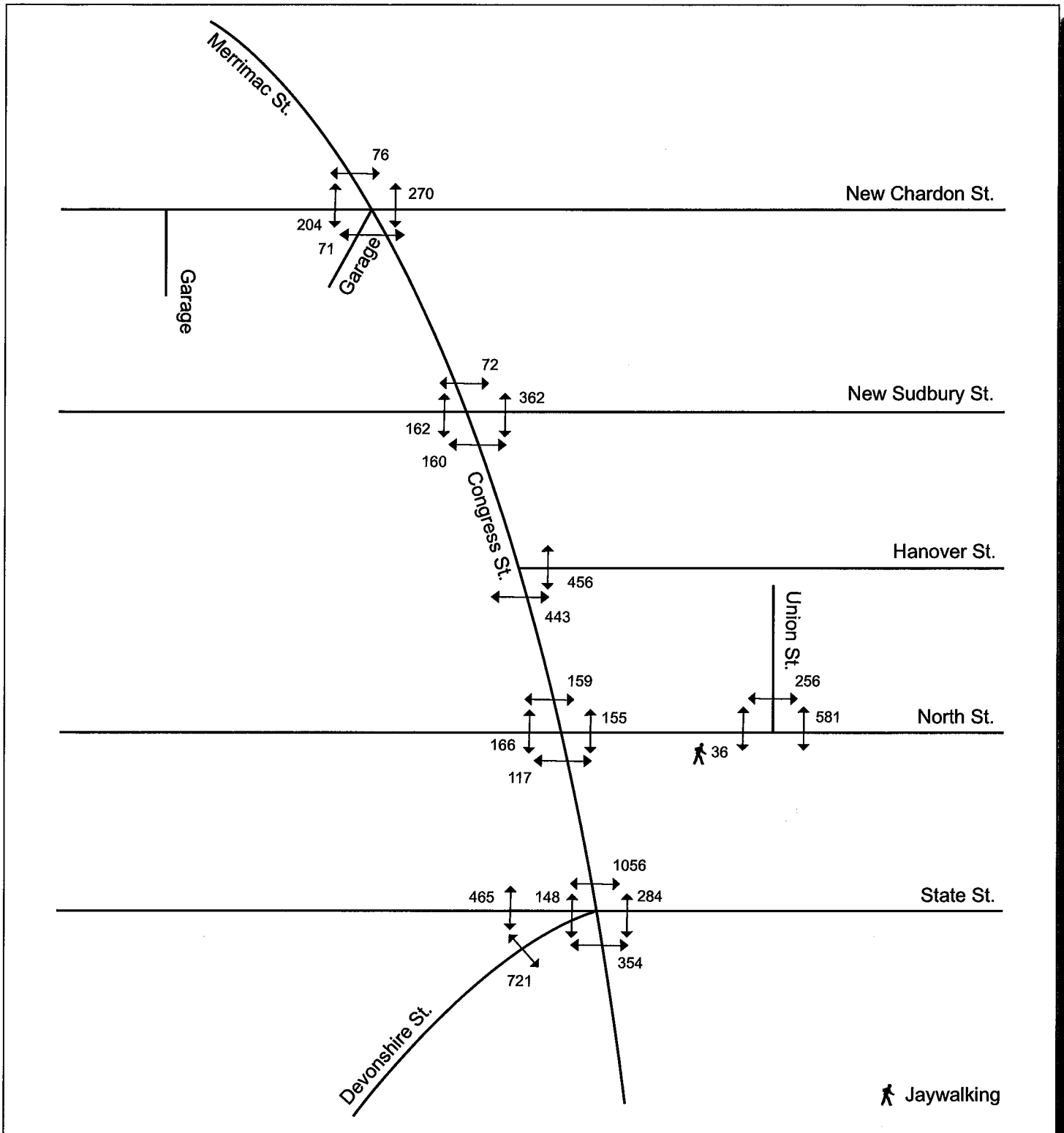
## Pedestrian Turning Movement Volumes, a.m. Peak Hour (8:00–9:00 a.m.)



Not to scale.

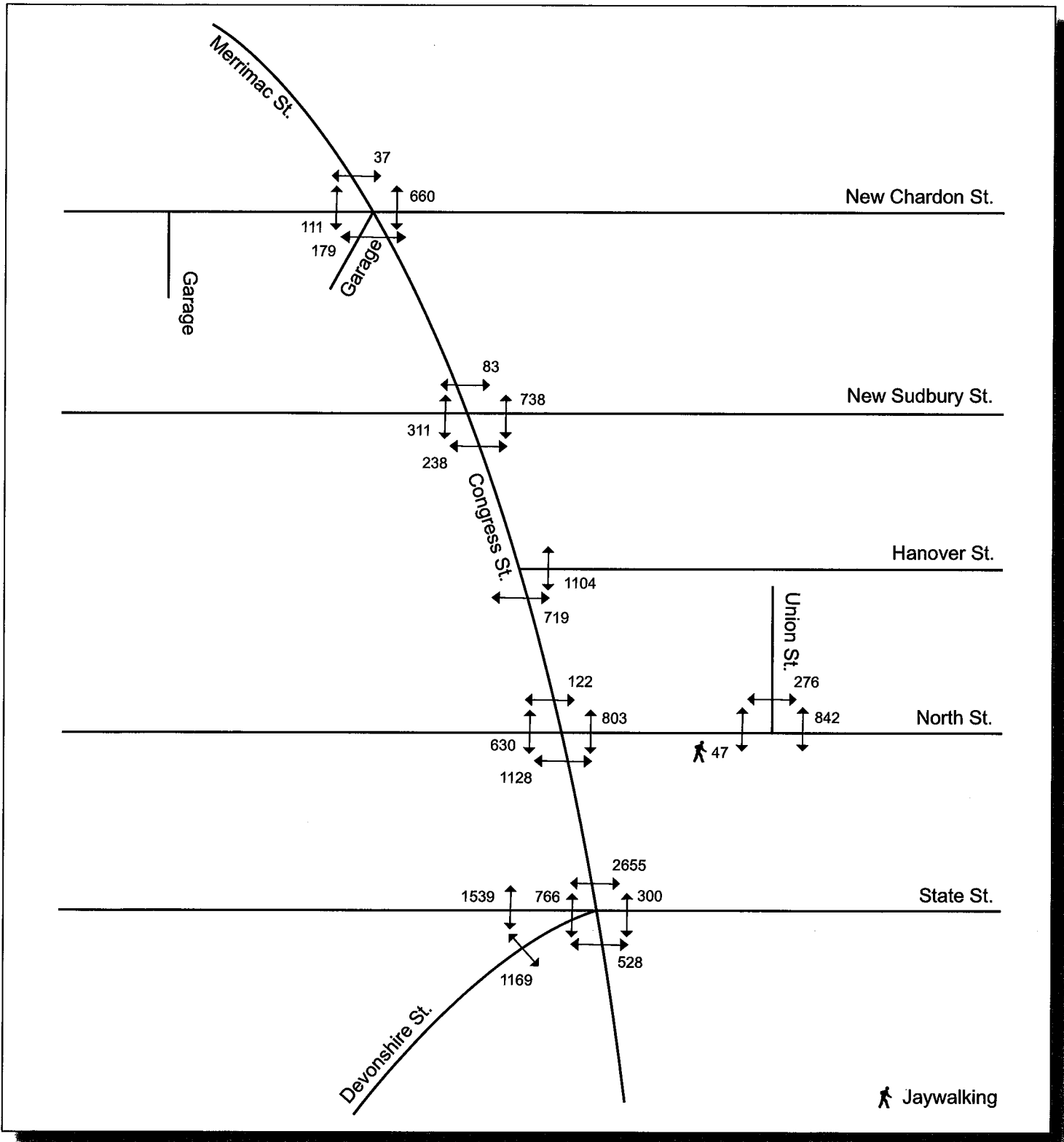


## Pedestrian Turning Movement Volumes, Mid-day Peak Hour (11:30 a.m.–12:30 p.m.)



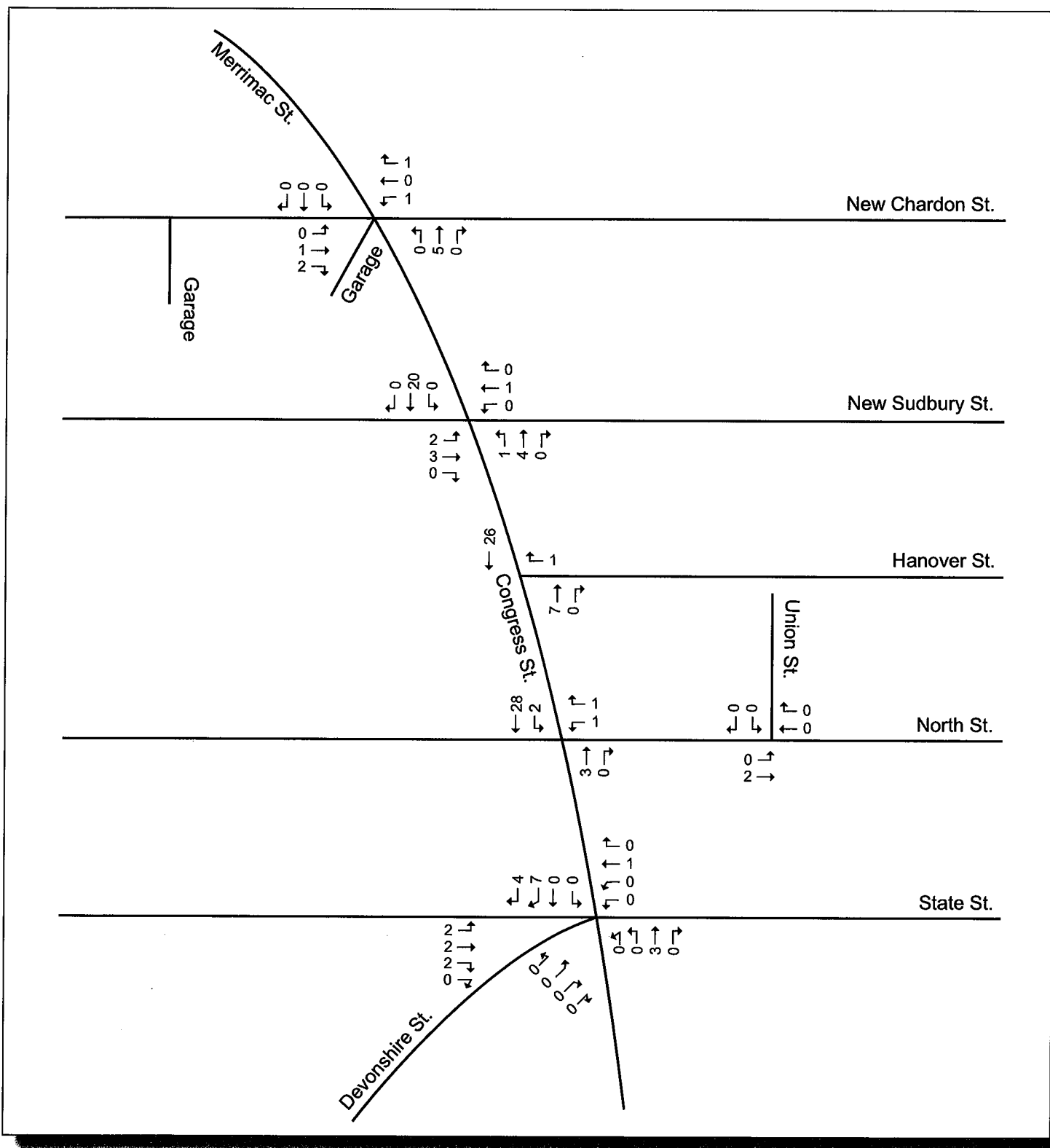
Not to scale.

## Pedestrian Turning Movement Volumes, p.m. Peak Hour (5:00–6:00 p.m.)



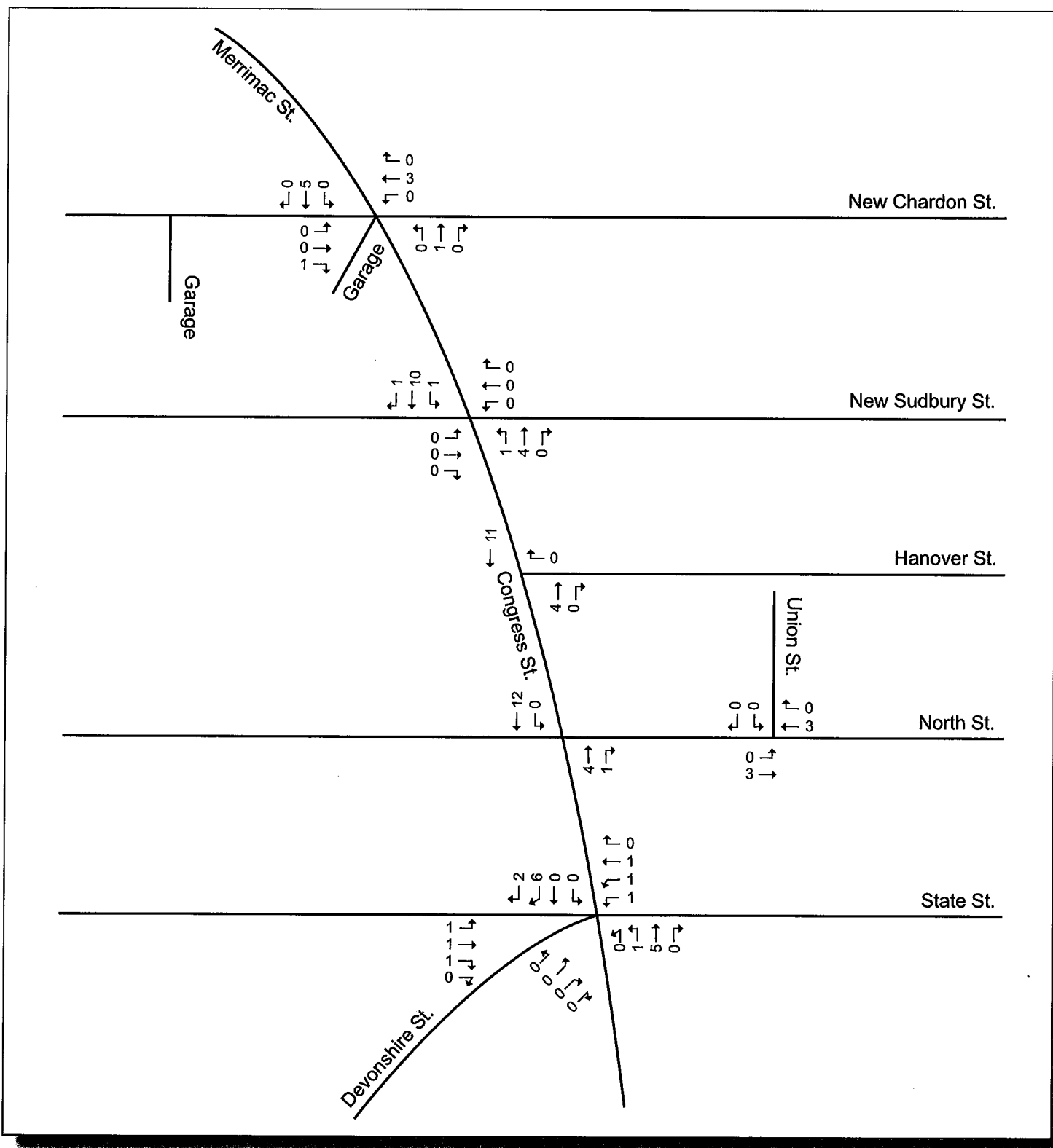
Not to scale.

## Bicycle Turning Movement Volumes, a.m. Peak Hour (8:00–9:00 a.m.)



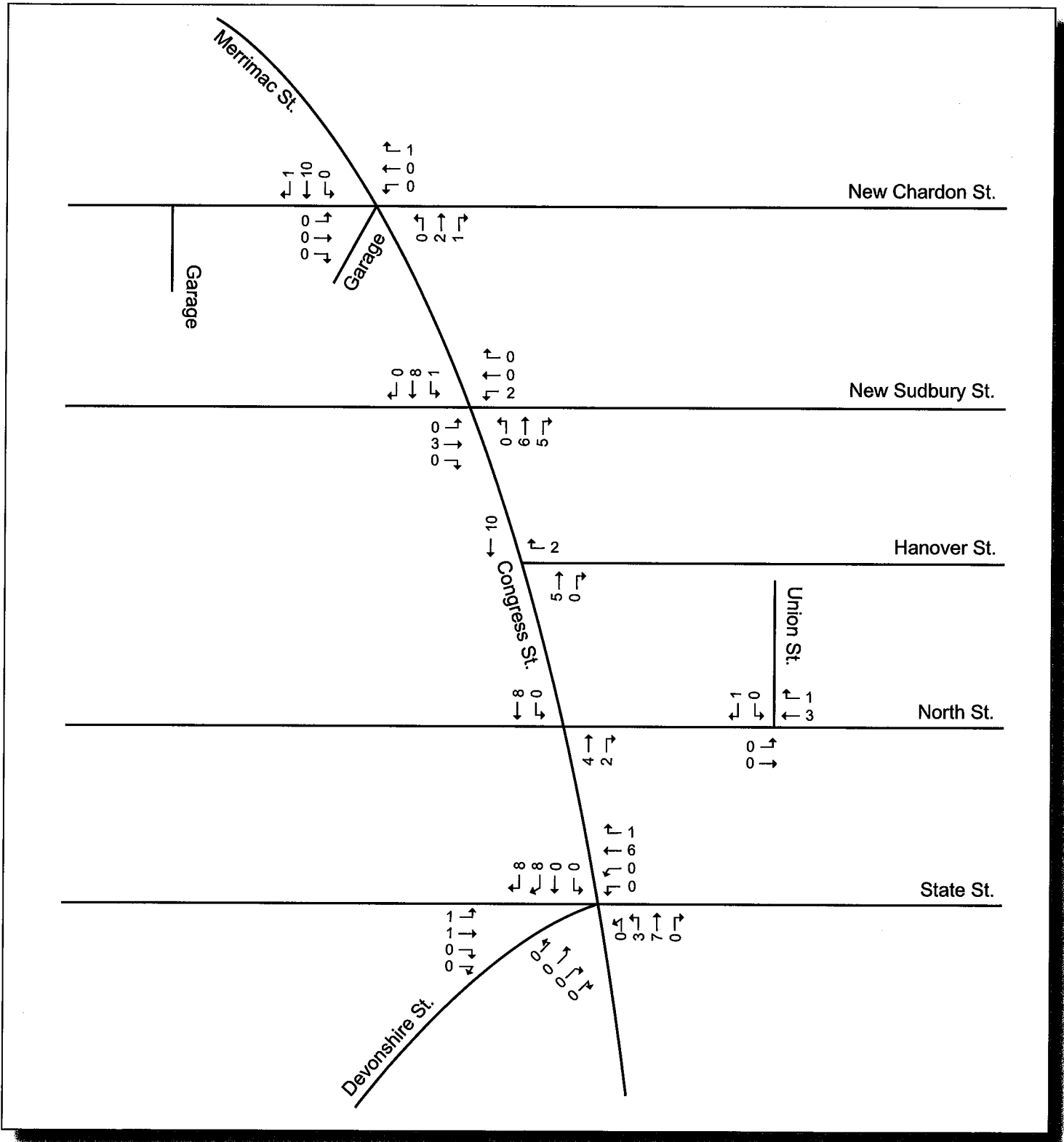
Not to scale.

## Bicycle Turning Movement Volumes, Mid-day Peak Hour (11:30 a.m.–12:30 p.m.)



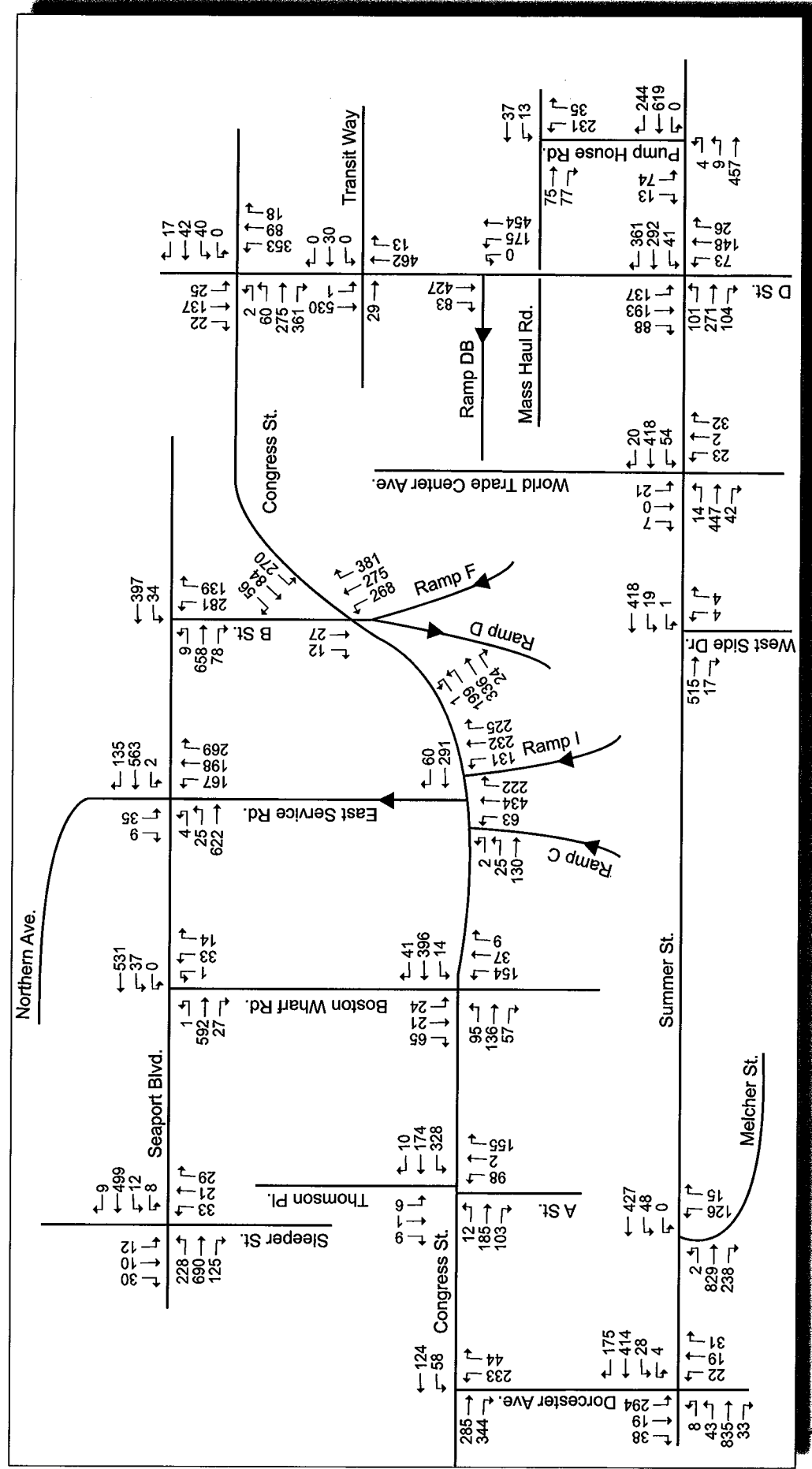
Not to scale.

## Bicycle Turning Movement Volumes, p.m. Peak Hour (5:00–6:00 p.m.)



Not to scale.

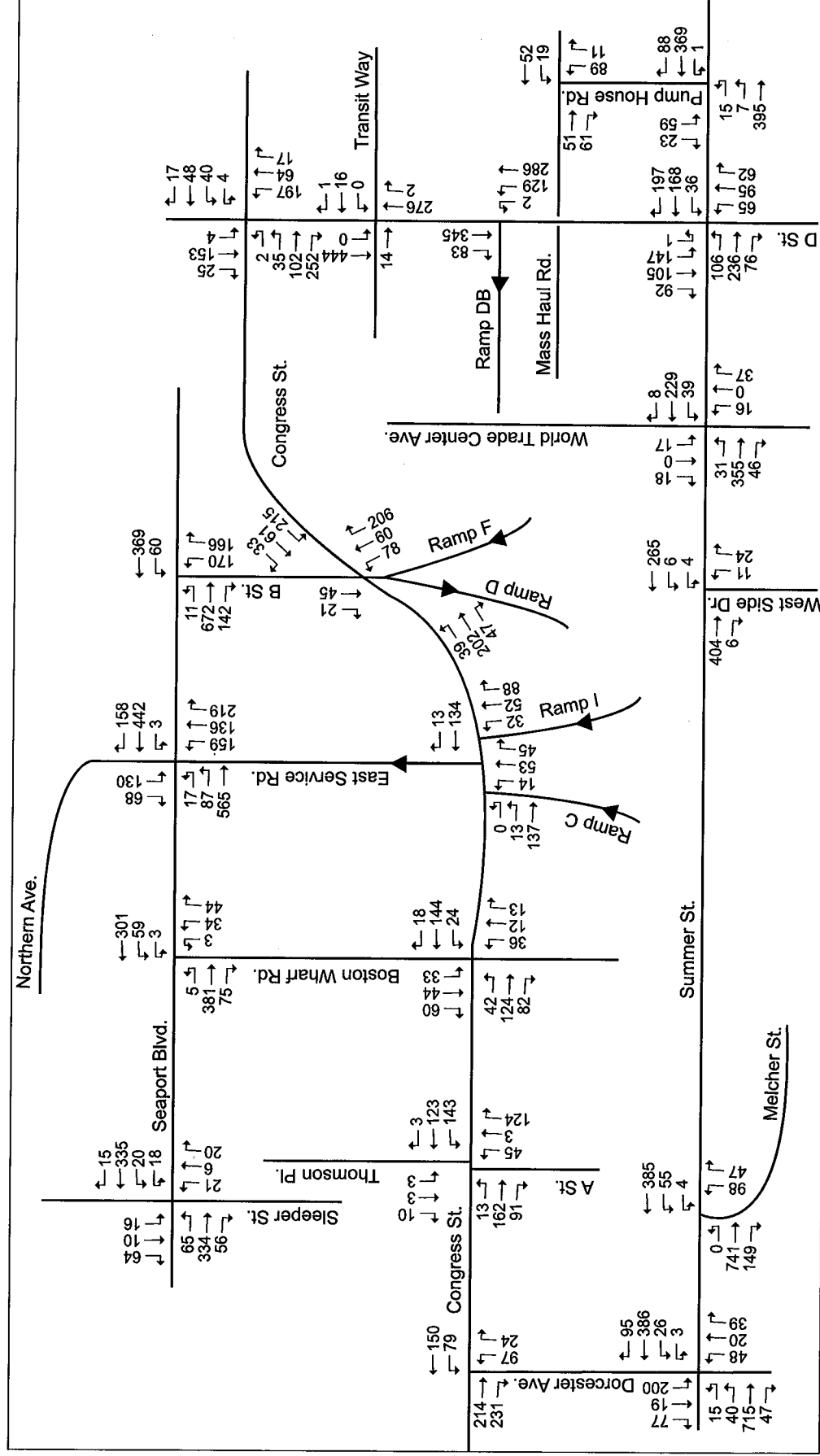
# Existing Conditions (2008) Vehicle Turning Movement Volumes, a.m. Peak-hour (8:00-9:00 a.m.)



Not to scale.



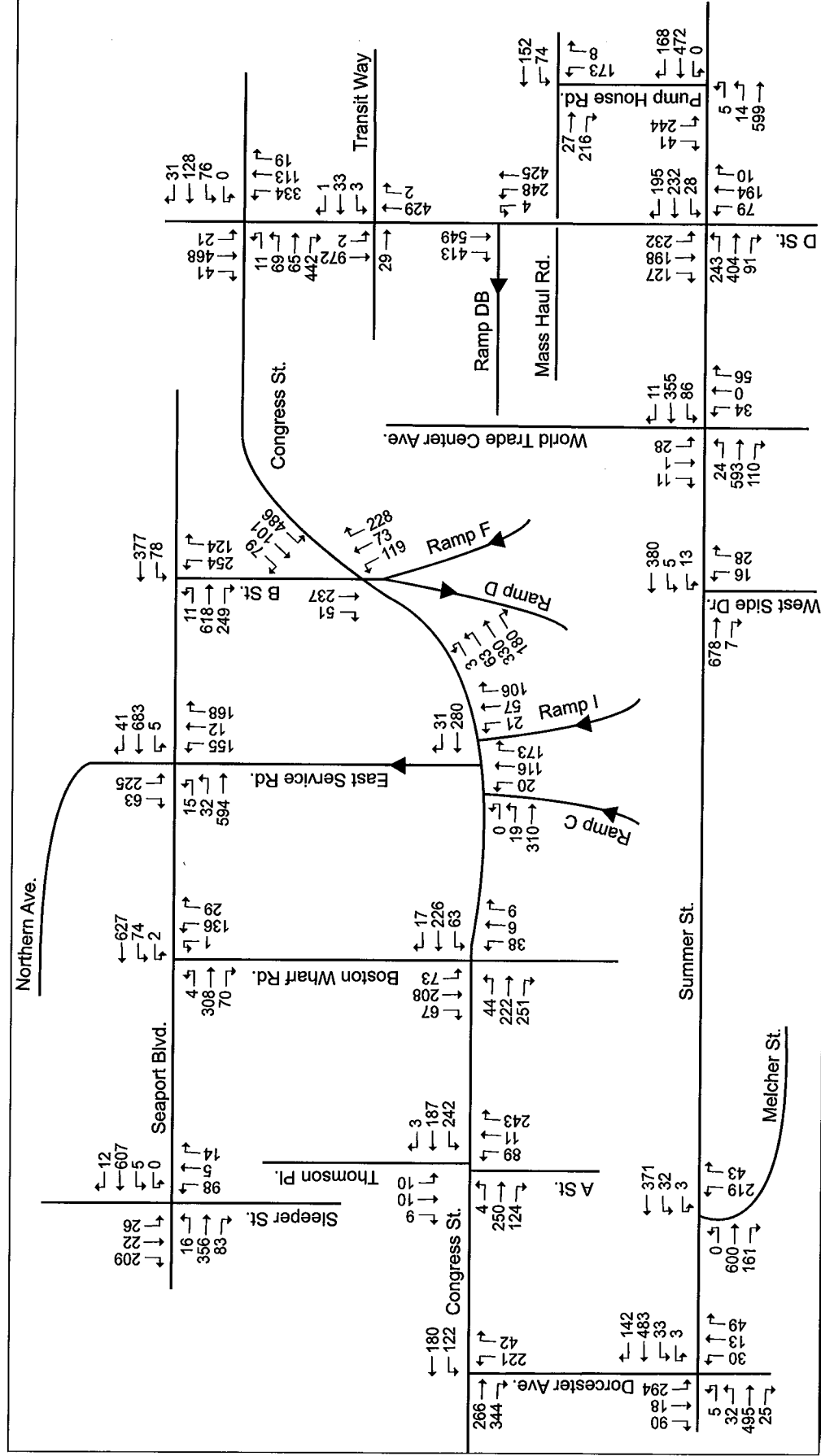
# Existing Conditions (2008) Vehicle Turning Movement Volumes, mid-day Peak-hour (11:30-12:30 p.m.)



Not to scale.

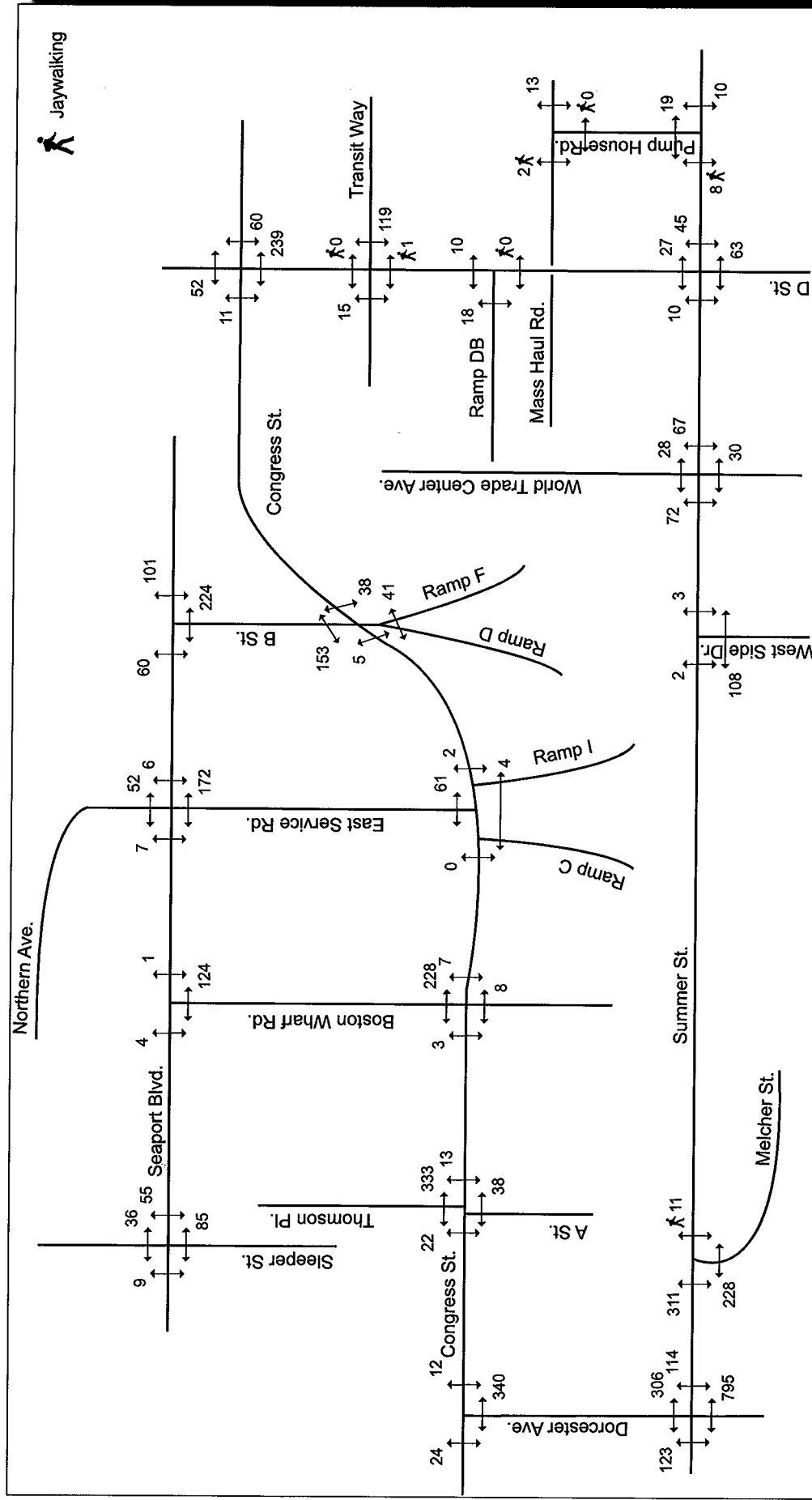


**Not to scale.**



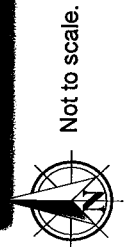
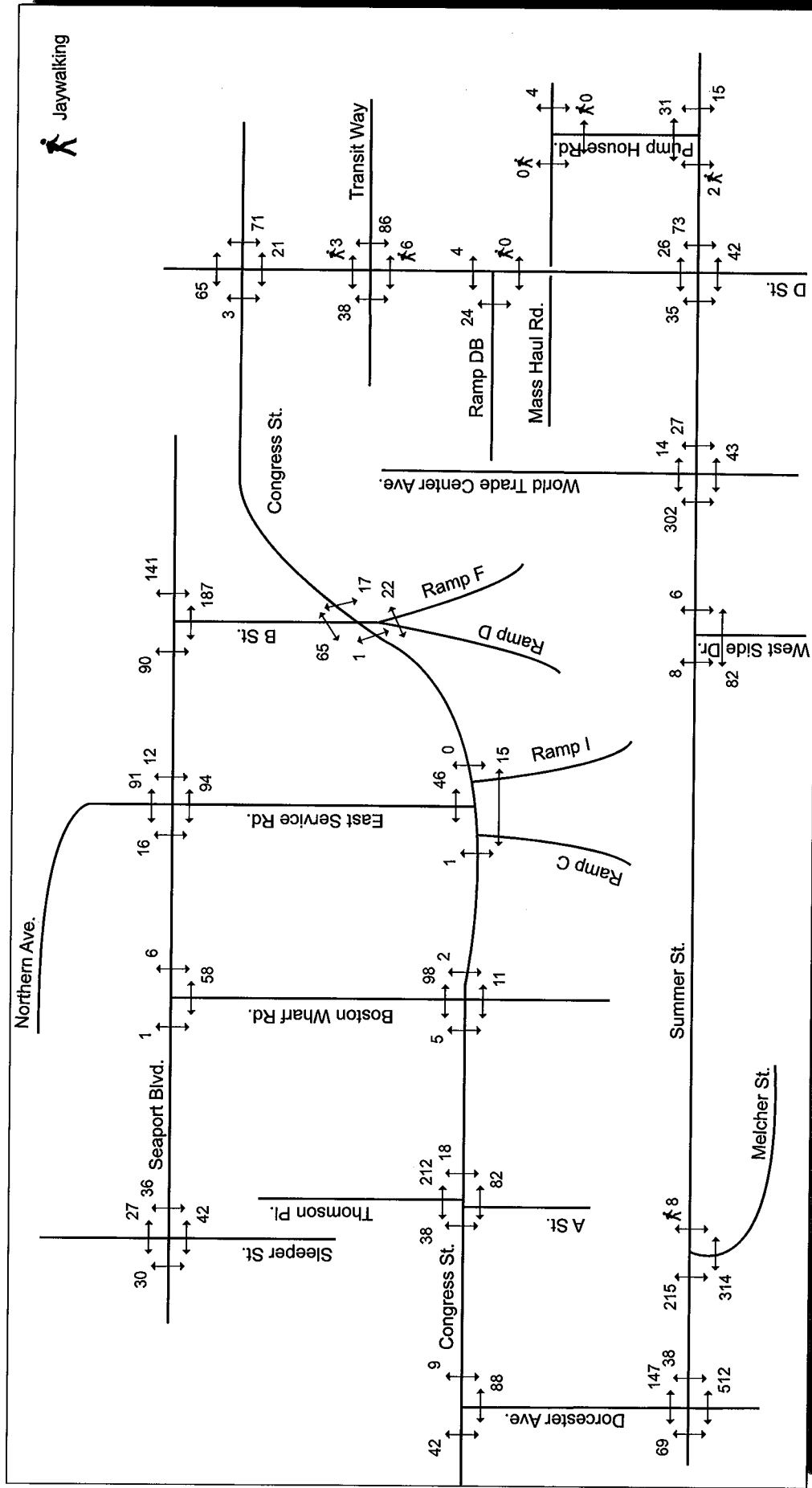


## Existing Conditions (2008) Pedestrian Turning Movement Volumes, a.m. Peak-hour (8:00-9:00 a.m.)



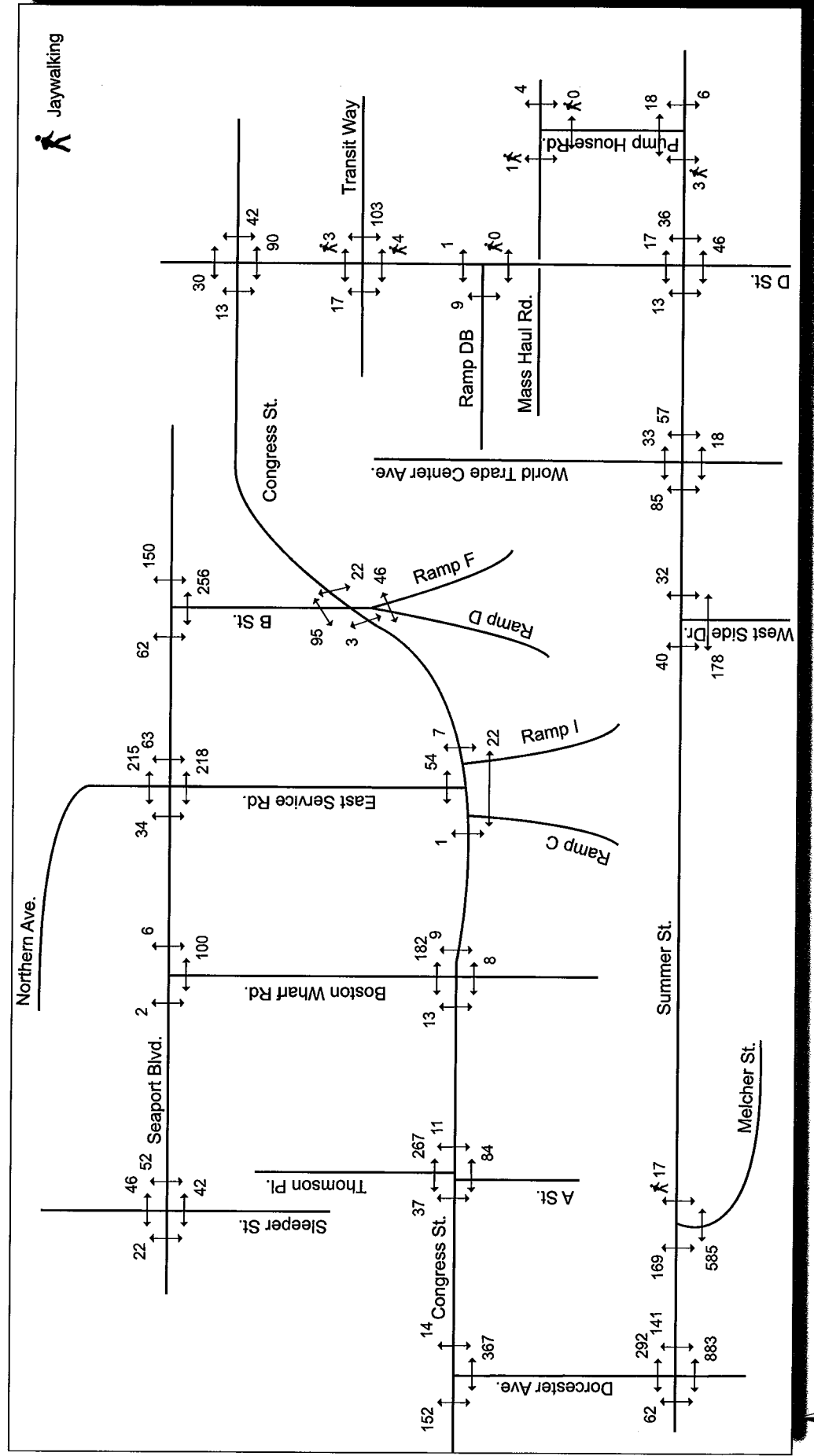
Not to scale.

## Existing Conditions (2008) Pedestrian Turning Movement Volumes, mid-day Peak-hour (11:30-12:30 p.m.)



Not to scale.

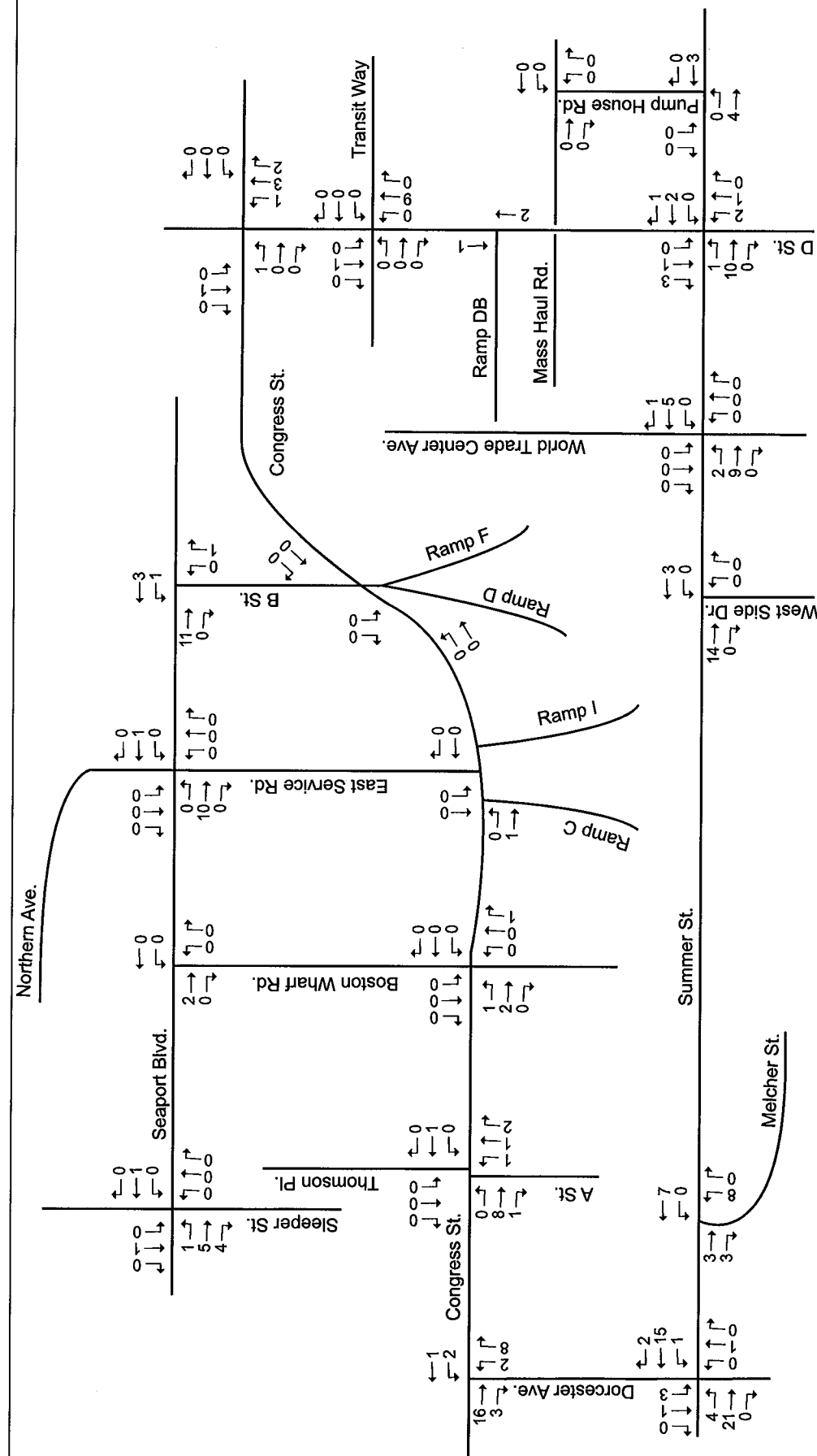
## Existing Conditions (2008) Pedestrian Turning Movement Volumes, p.m. Peak-hour (5:00-6:00 p.m.)



Not to scale.



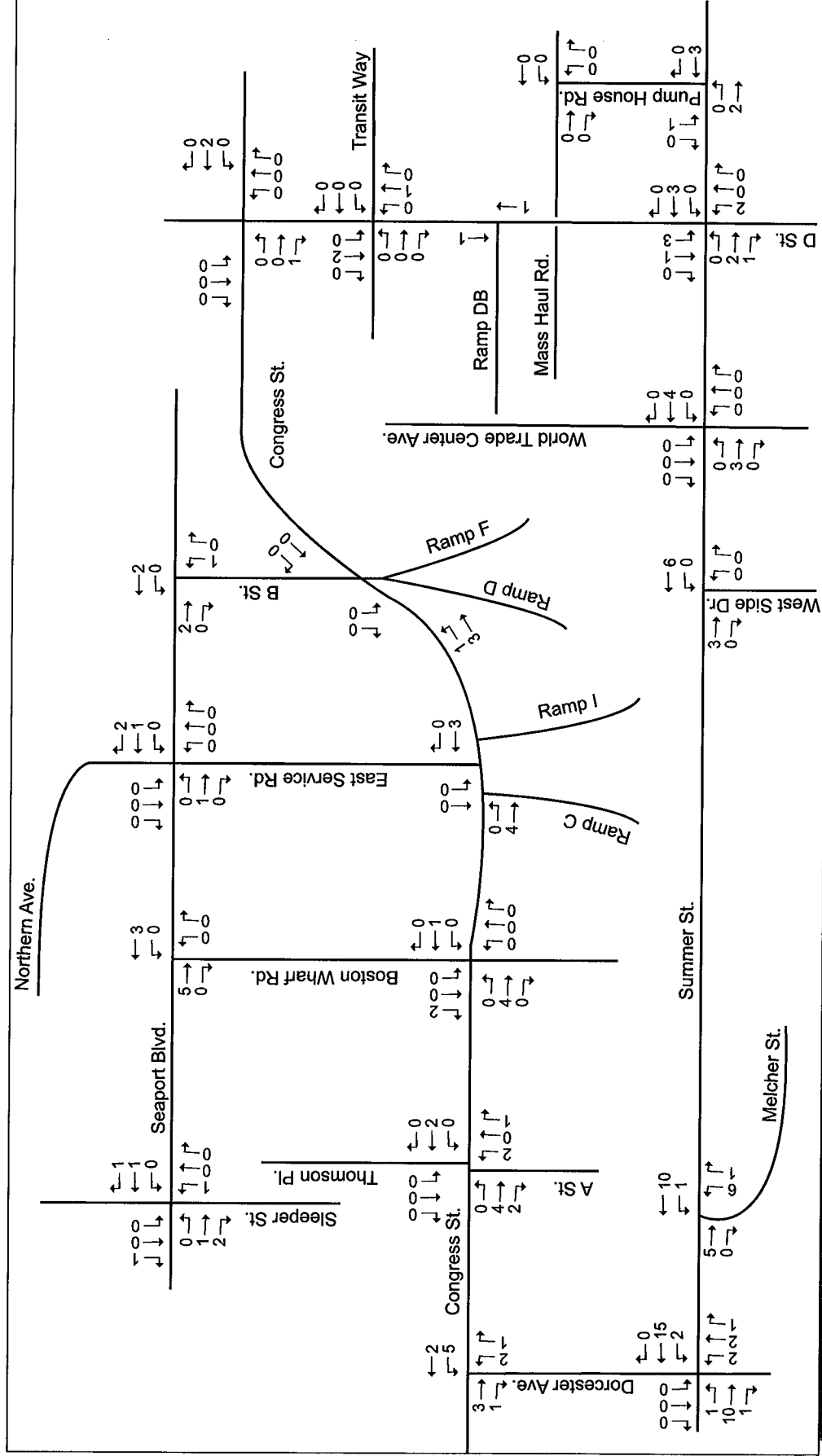
### Existing Conditions (2008) Bicycle Turning Movement Volumes, a.m. Peak-hour (8:00-9:00 a.m.)



**Not to scale.**



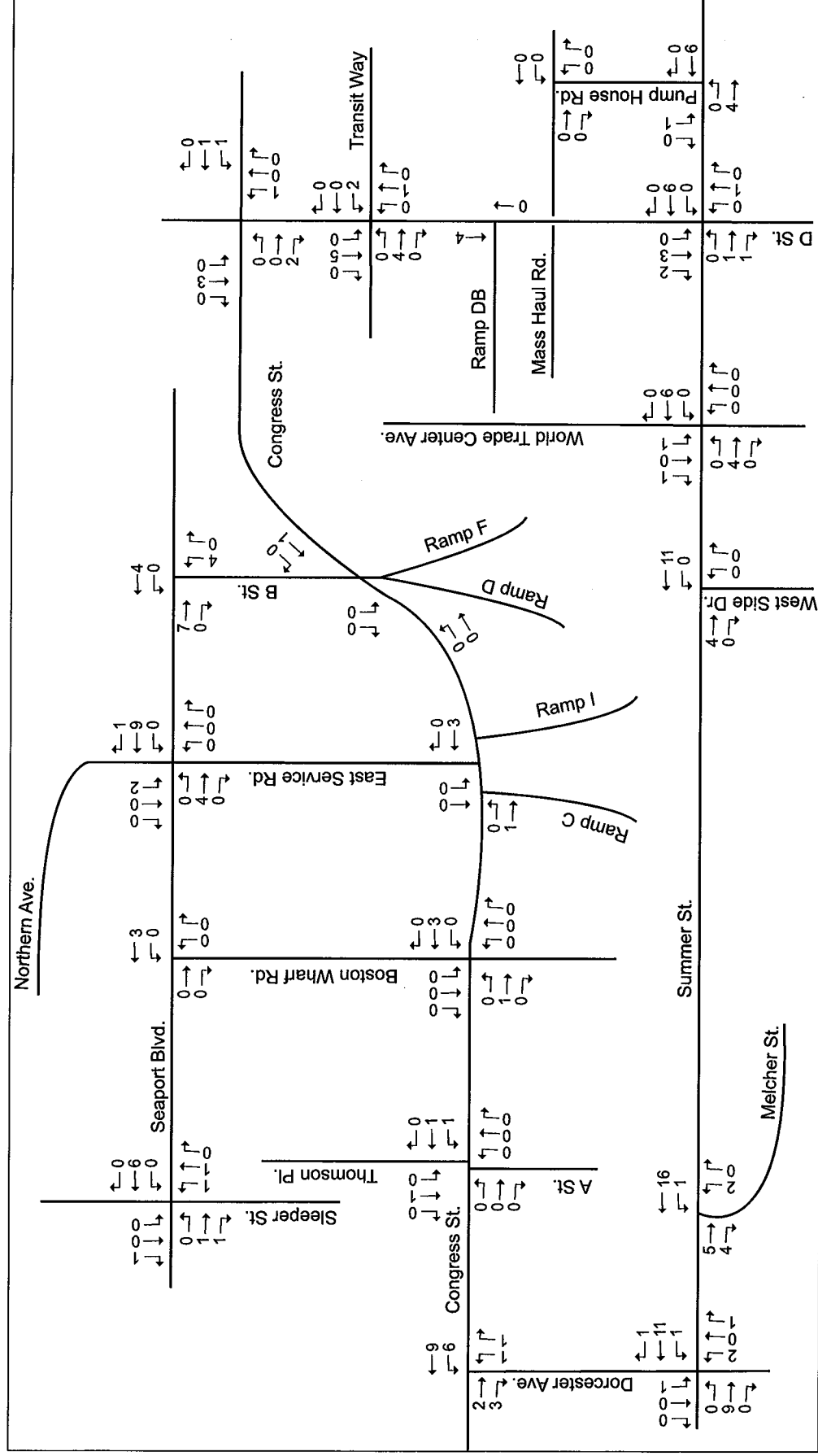
# Existing Conditions (2008) Bicycle Turning Movement Volumes, mid-day Peak-hour (11:30-12:30 p.m.)



Not to scale.

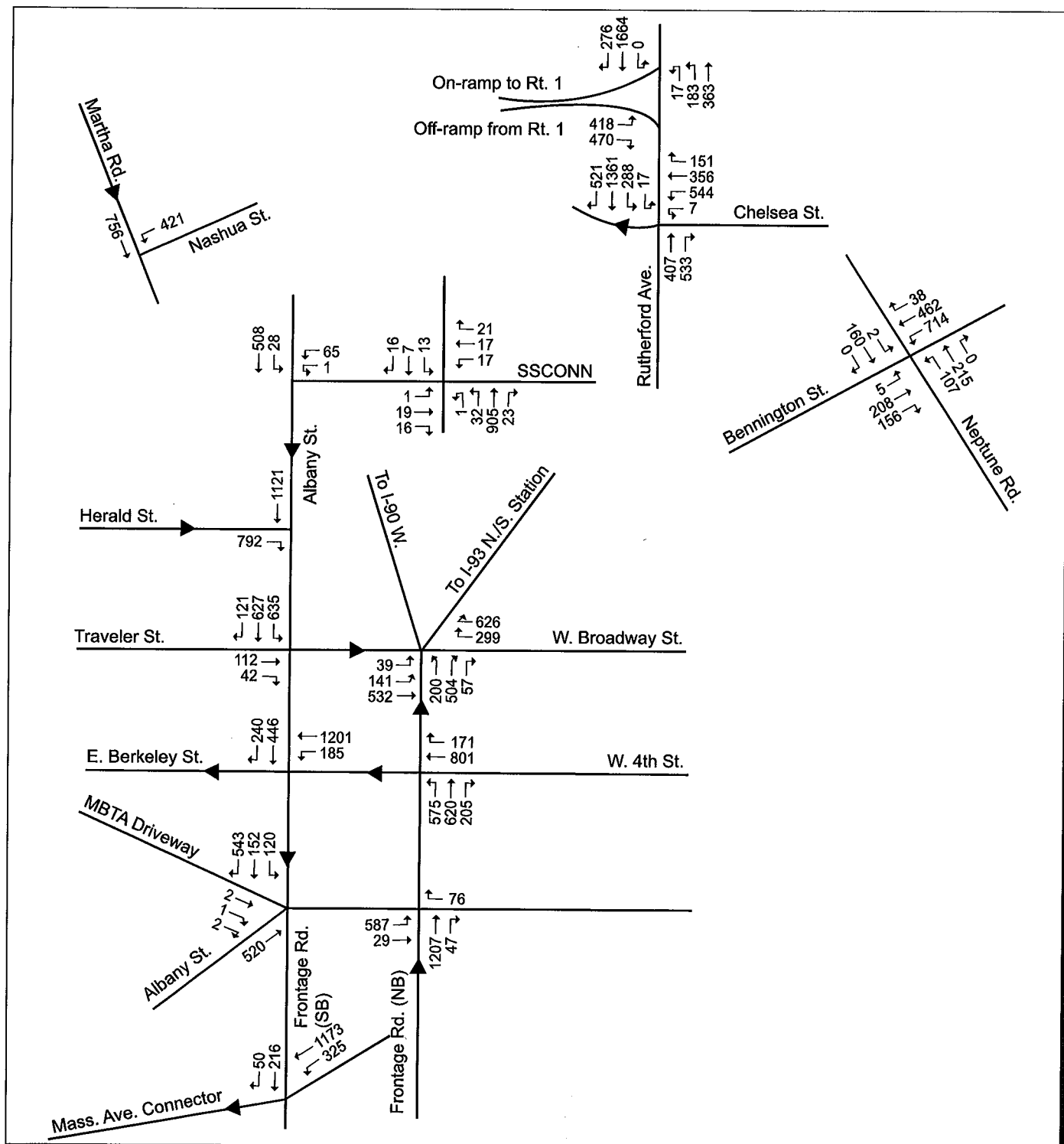


# Existing Conditions (2008) Bicycle Turning Movement Volumes, p.m. Peak-hour (5:00-6:00 p.m.)



Not to scale.

## Vehicle Turning Movement Volumes, a.m. Peak Hour (8:00-9:00 a.m.)



Not to scale.

The diagram illustrates the traffic volume distribution at the intersection of Albany Street and Frontage Road (NB). The following table summarizes the traffic volumes for each approach and movement:

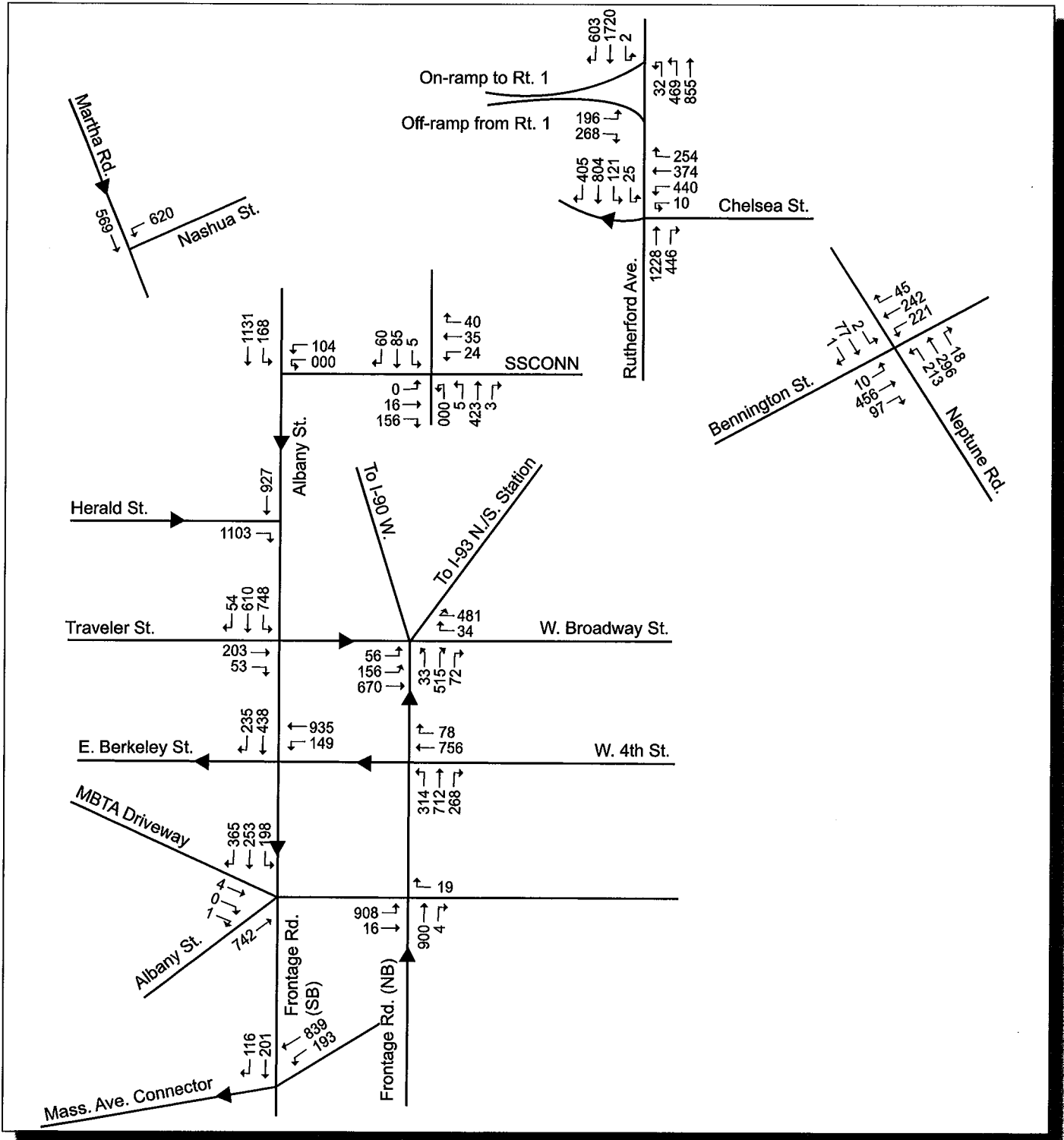
Approach	Movement	Volume
Martha Rd.	Left	422
Nashua St.	Left	276
Herald St.	Through	722
Traveler St.	Left	44
Traveler St.	Through	478
Traveler St.	Right	530
E. Berkeley St.	Left	194
E. Berkeley St.	Through	361
MBTA Driveway	Left	283
MBTA Driveway	Through	178
MBTA Driveway	Right	133
Albany St.	Left	378
Mass. Ave. Connector	Left	94
Mass. Ave. Connector	Through	200
Frontage Rd. (SB)	Left	87
Frontage Rd. (SB)	Through	305
Frontage Rd. (NB)	Left	451
Frontage Rd. (NB)	Through	24
Frontage Rd. (NB)	Right	848
W. Broadway St.	Left	139
W. Broadway St.	Through	445
W. Broadway St.	Right	40
W. 4th St.	Left	97
W. 4th St.	Through	444
W. 4th St.	Right	268
W. 4th St.	Through	538
W. 4th St.	Right	213
SSCONN	Left	42
SSCONN	Through	183
SSCONN	Right	370
Rutherford Ave.	Left	175
Rutherford Ave.	Through	161
Rutherford Ave.	Right	14
Chelsea St.	Left	513
Chelsea St.	Through	627
Chelsea St.	Right	136
Bennington St.	Left	8
Bennington St.	Through	10
Bennington St.	Right	50
Neptune Rd.	Left	1
Neptune Rd.	Through	5
Neptune Rd.	Right	301
Neptune Rd.	Through	100
Neptune Rd.	Right	245
Neptune Rd.	Through	14
Neptune Rd.	Right	291
Neptune Rd.	Through	251
Neptune Rd.	Right	16
Neptune Rd.	Through	374
Neptune Rd.	Right	1463
Neptune Rd.	Through	16
Neptune Rd.	Right	16
Neptune Rd.	Through	301
Neptune Rd.	Right	490
Neptune Rd.	Through	139
Neptune Rd.	Right	194
Neptune Rd.	Through	206
Neptune Rd.	Right	8
Neptune Rd.	Through	448
Neptune Rd.	Right	252



Not to scale.

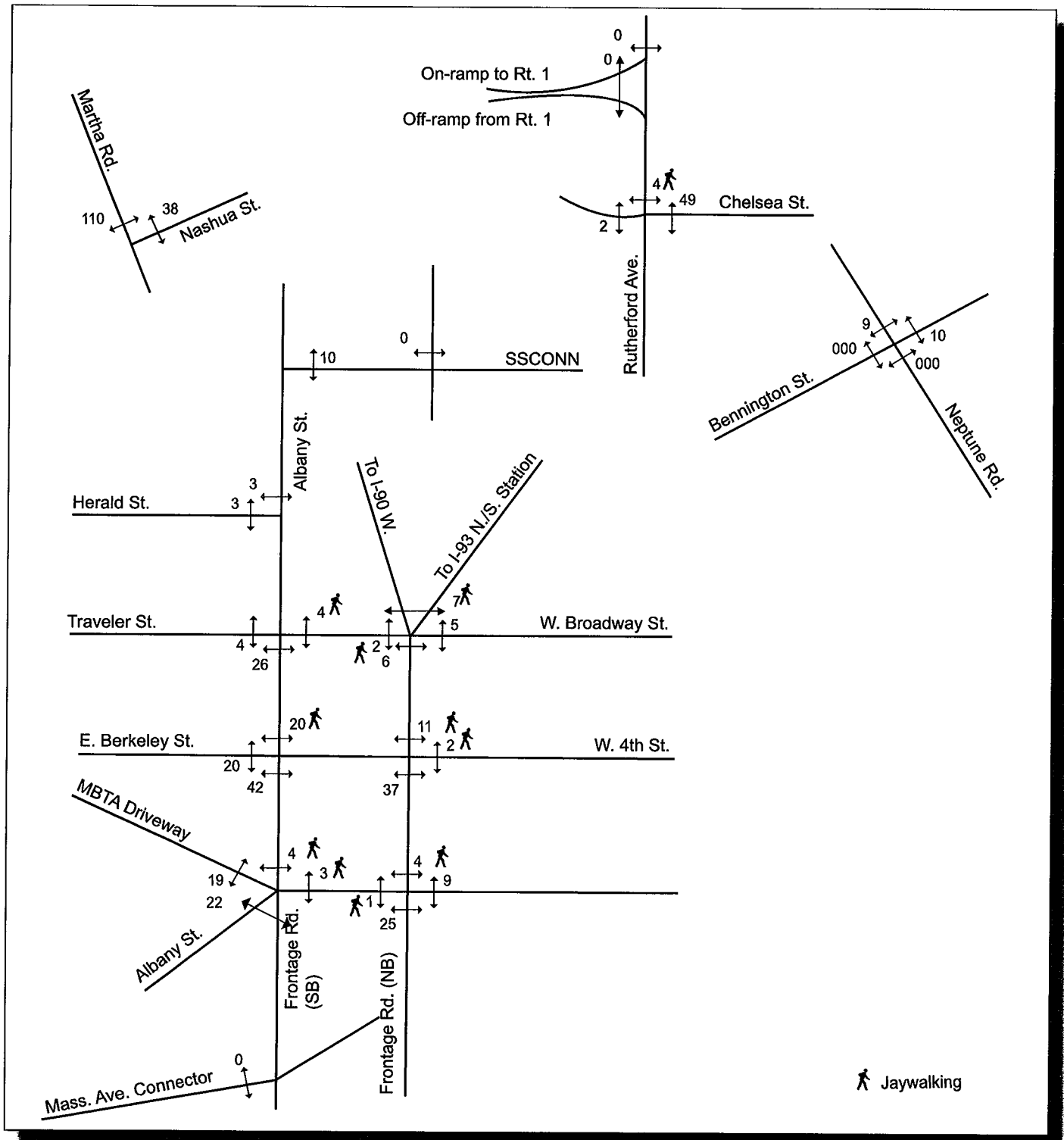


## Vehicle Turning Movement Volumes, p.m. Peak Hour (5:00 - 6:00 p.m.)



Not to scale.

## Pedestrian Turning Movement Volumes, a.m. Peak Hour (8:00-9:00 a.m.)



Not to scale.

This map illustrates the downtown Boston area, highlighting various streets and pedestrian crossings. Key streets include Martha Rd., Nashua St., Herald St., Traveler St., E. Berkeley St., MBTA Driveway, Albany St., Frontage Rd. (SB), Mass. Ave. Connector, SSSCONN, W. Broadway St., W. 4th St., Frontage Rd. (NB), Rutherford Ave., Chelsea St., Bennington St., and Neptune Rd. The map also shows the locations of the MBTA Station and the I-93 N/S Station. Pedestrian crossings are marked with numbers and arrows, and jaywalking locations are indicated by stick figures. The map is oriented with North at the top.

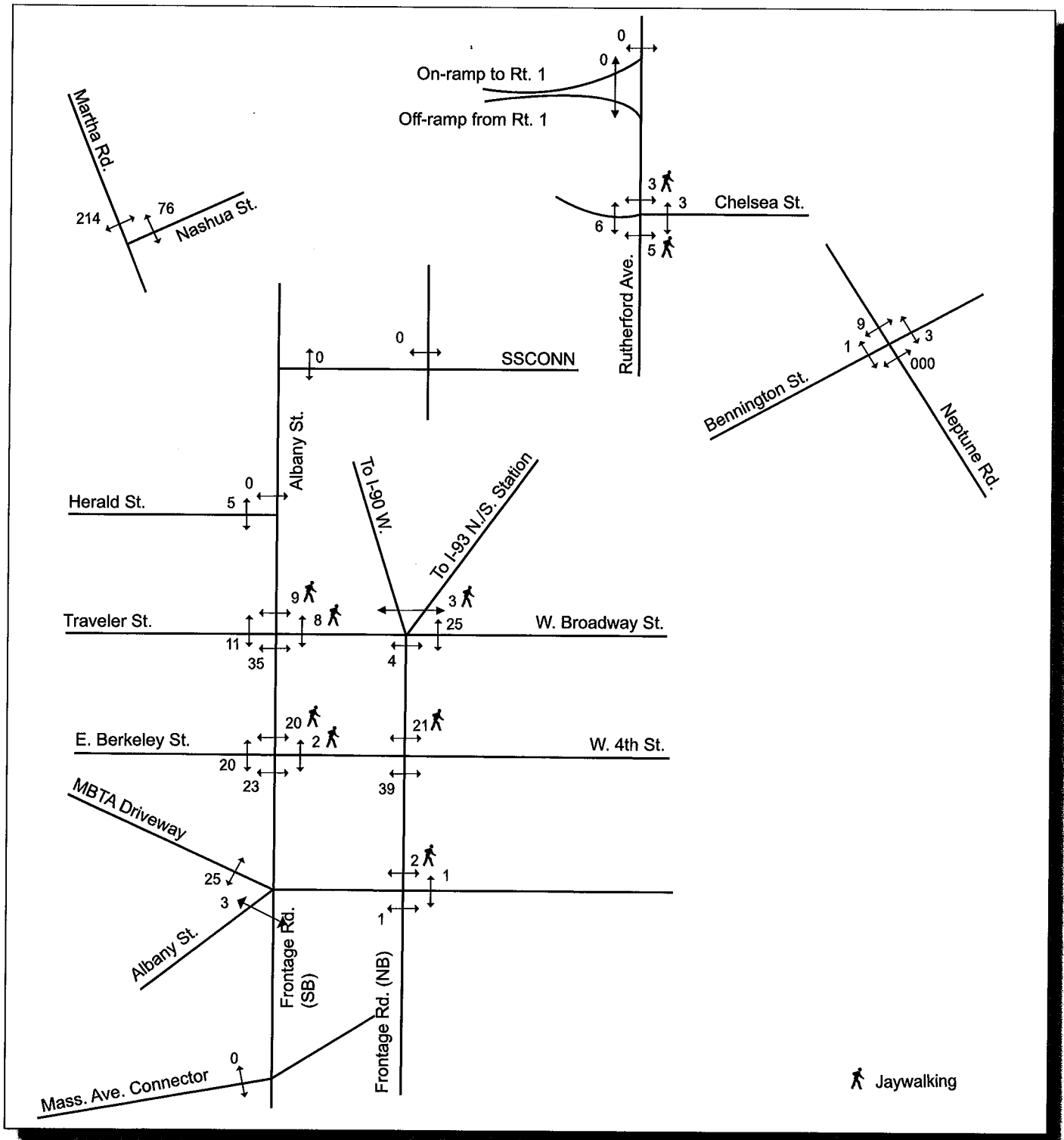
**Legend:**

- Jaywalking



Not to scale.

## Pedestrian Turning Movement Volumes, p.m. Peak Hour (5:00 - 6:00 p.m.)



Not to scale.

The diagram illustrates the downtown Springfield, Massachusetts area, showing the intersection of various streets and the locations of bus stops. The streets shown include Martha Rd., Nashua St., Herald St., Traveler St., E. Berkeley St., MBTA Driveway, Albany St., Mass. Ave. Connector, Frontage Rd. (SB), Frontage Rd. (NB), W. Broadway St., W. 4th St., Bennington St., Neptune Rd., Rutherford Ave., Chelsea St., and SSSCONN. Bus stops are marked with numbers and arrows indicating the direction of travel. The diagram also shows the locations of the MBTA and SSSCONN bus lines.

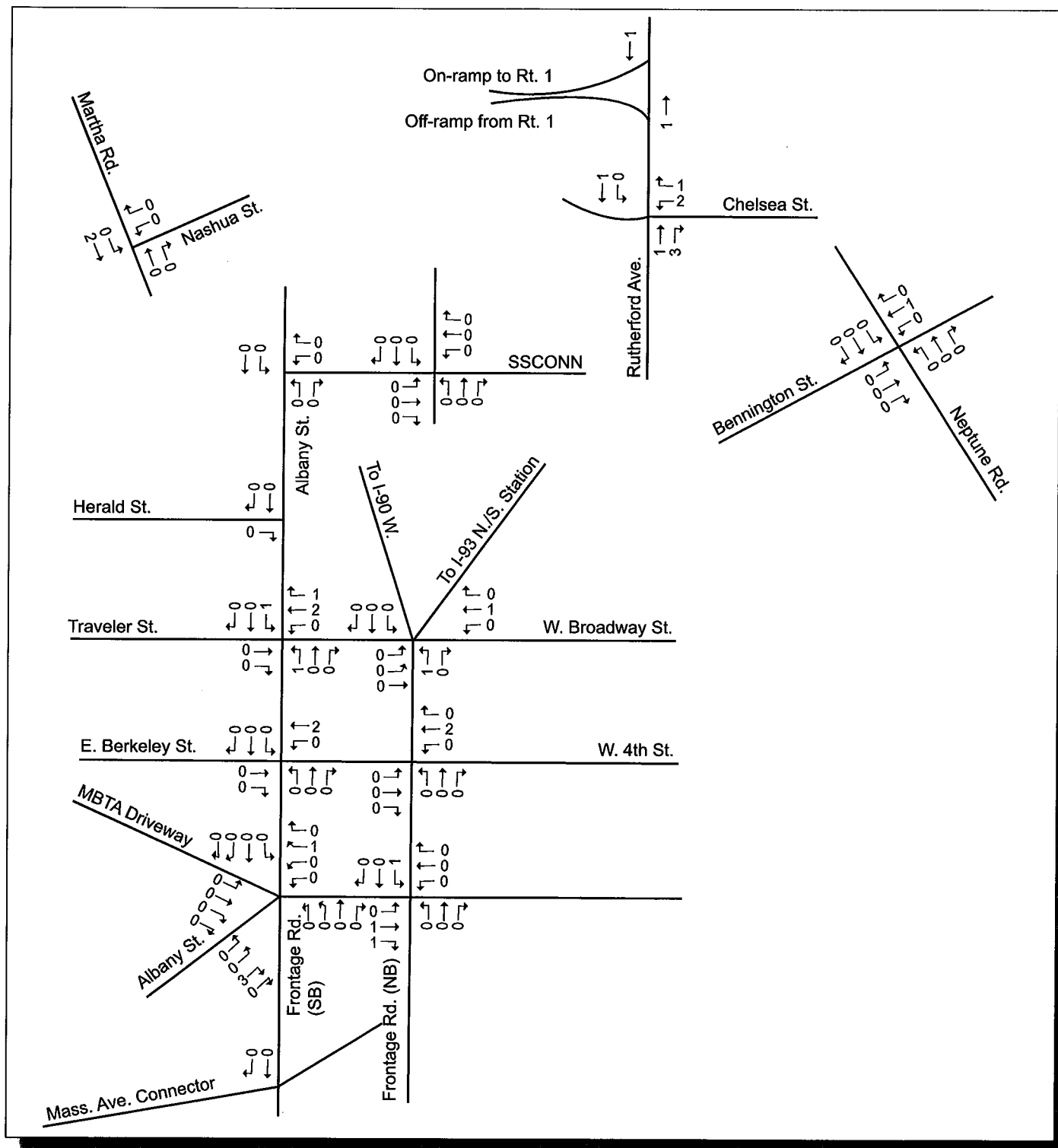
Key features include:

- Streets:** Martha Rd., Nashua St., Herald St., Traveler St., E. Berkeley St., MBTA Driveway, Albany St., Mass. Ave. Connector, Frontage Rd. (SB), Frontage Rd. (NB), W. Broadway St., W. 4th St., Bennington St., Neptune Rd., Rutherford Ave., Chelsea St., and SSSCONN.
- Bus Stops:** Marked with numbers and arrows indicating the direction of travel. For example, at the intersection of W. Broadway St. and Frontage Rd. (NB), there are bus stops for routes 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.
- Bus Lines:** MBTA and SSSCONN.



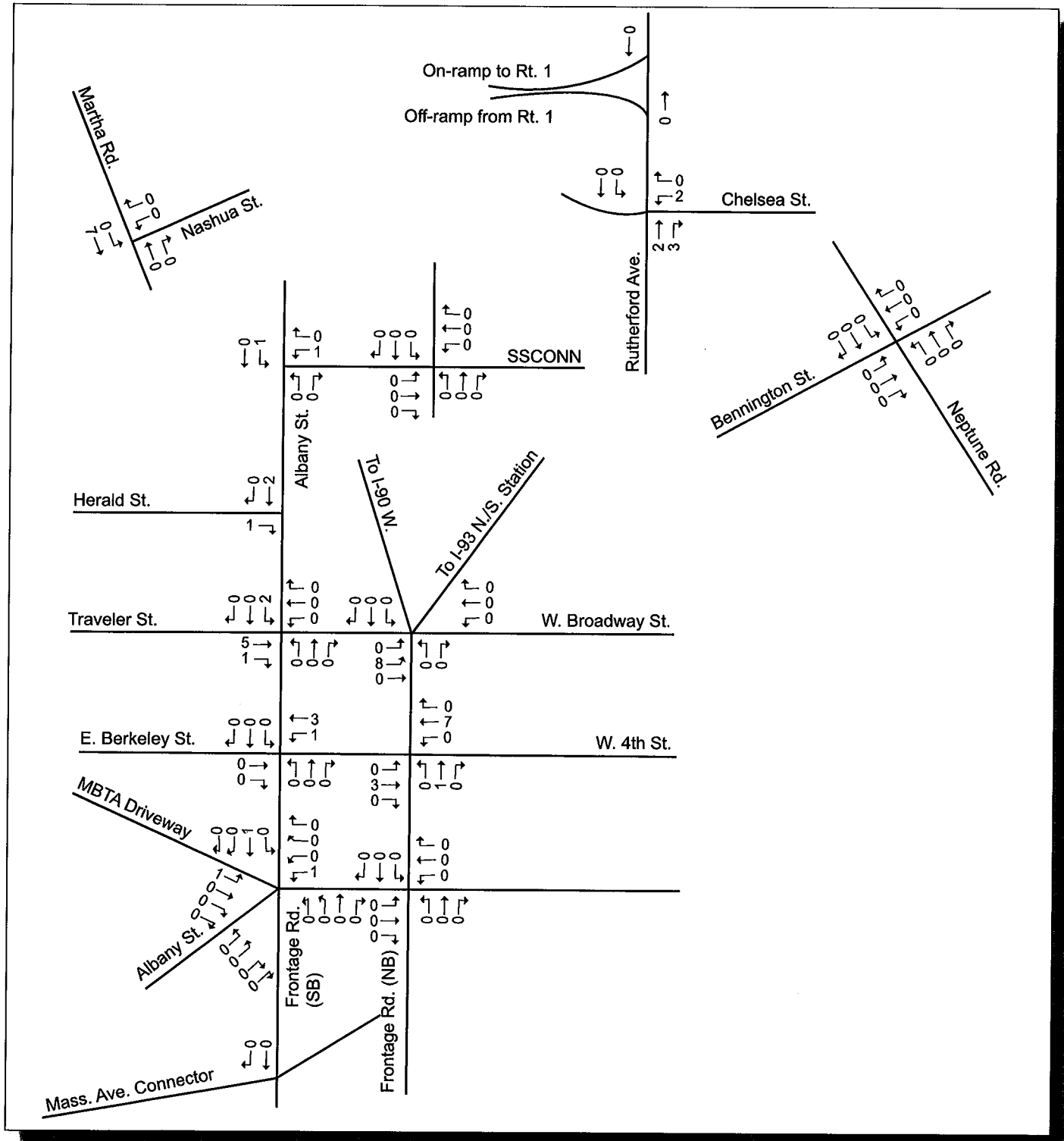
Not to scale.

## Bicycle Turning Movement Volumes, Mid-day Peak Hour (11:30 a.m. - 12:30 p.m.)



Not to scale.

## Bicycle Turning Movement Volumes, p.m. Peak Hour (5:00 - 6:00 p.m.)



Not to scale.

## Appendix B. Signal Warrant Analysis

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TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/5/08  
Major Street: Atlantic Ave  
Minor Street: Pearl St.  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420								
Highest Approach on Minor Street	150 (120)	105	200 (160)	140								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☐ Yes ☒ No  
Excessive Delay: ☐ Yes ☒ No  
100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630								
Highest Approach on Minor Street	75 (60)	53	100 (80)	70								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☒

WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☒

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/5/08

Major Street: Atlantic Ave  
Minor Street: Pearl St.

Lanes: 3 Critical Approach Speed: 36  
Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

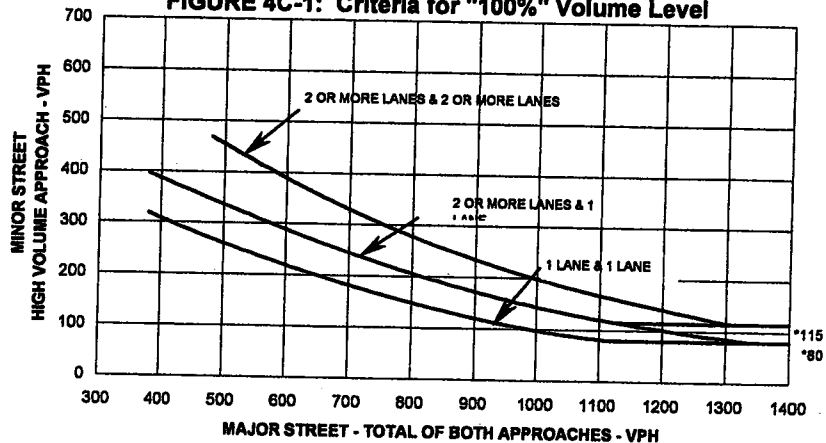
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

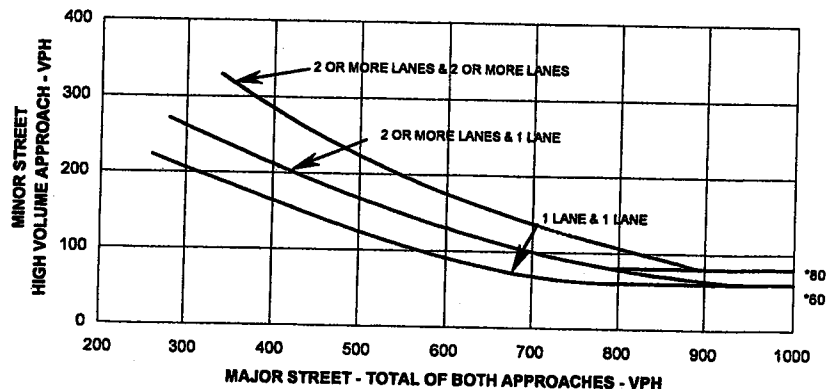
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: Pearl St.

Engineer: A. Siu  
Date: 11/5/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour	

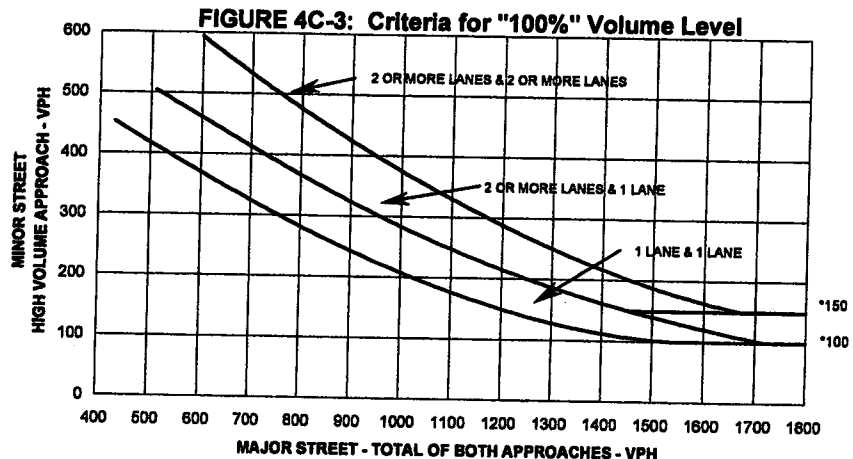
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

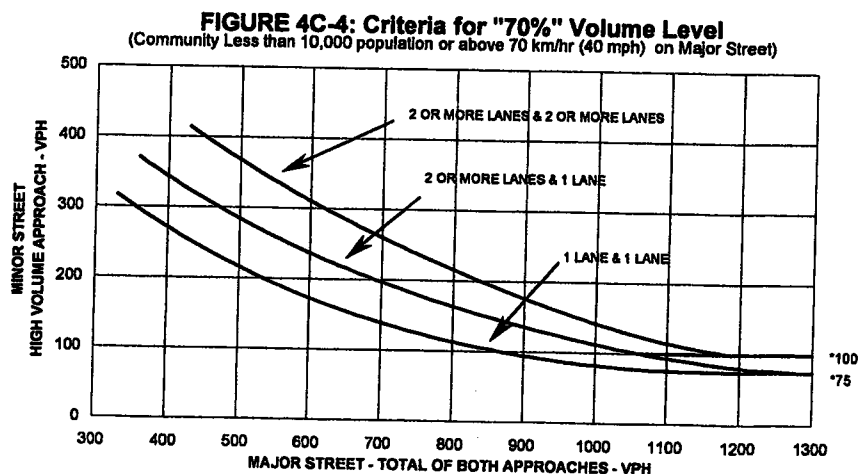
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sim  
County: Suffolk Date: 11/5/08  
Major Street: Atlantic Ave. Lanes: 3 Critical Approach Speed: 30  
Minor Street: Pearl St. Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7:00	94			
	8:00	127			
	11:00	100			
	12:00	173			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: Pearl St.

Engineer: A. Siu  
Date: 11/5/08  
Lanes: 3  
Lanes: 2 Critical Approach Speed: 30

## WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:						
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		<u>1</u>		<input checked="" type="checkbox"/>

## WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume:				
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant: 1 2 3 Satisfied?:		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		<u>NO DATA</u>		← Hour ← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

## CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_  
\_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 10/5/08  
Major Street: Purchase St / SASB Lanes: 3 Critical Approach Speed: 36  
Minor Street: Pearl St. Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1140	1077	1077	1076	1084	1237	1215	1561
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	250	218	124	99	117	107	107	129

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1140	1077	1077	1076	1084	1237	1215	1561
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	250	218	124	99	117	107	107	129

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase / SARB  
Minor Street: Pearl St.

Engineer: A. Siu  
Date: 11/5/00  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

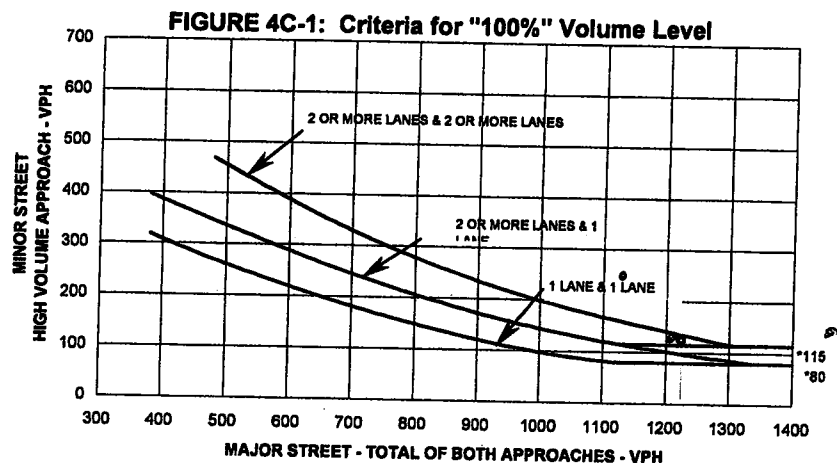
☐ Yes ☒ No  
☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level  
☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

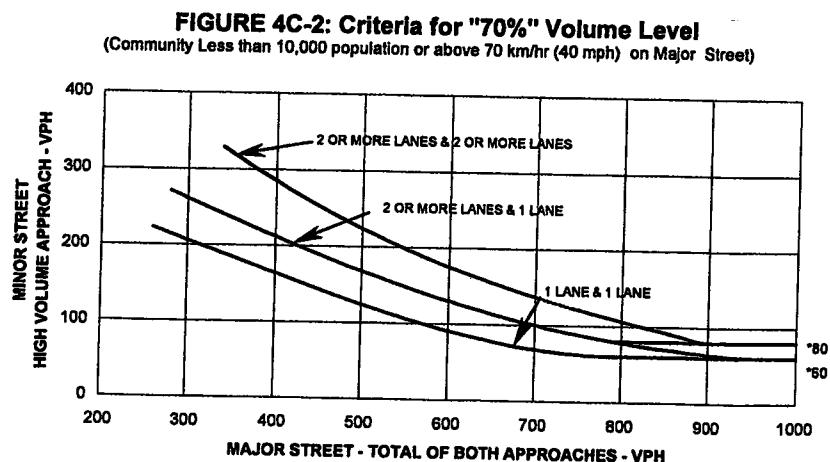
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1140	250
1500	1237	107
1600	1215	107
1700	1561	129

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SARB  
Minor Street: Pearl St

Engineer: A. Siu  
Date: 11/5/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	1812	129

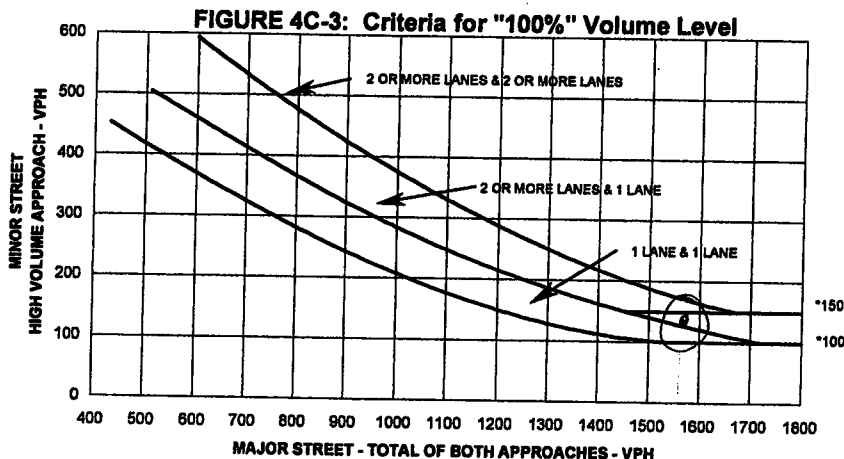
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

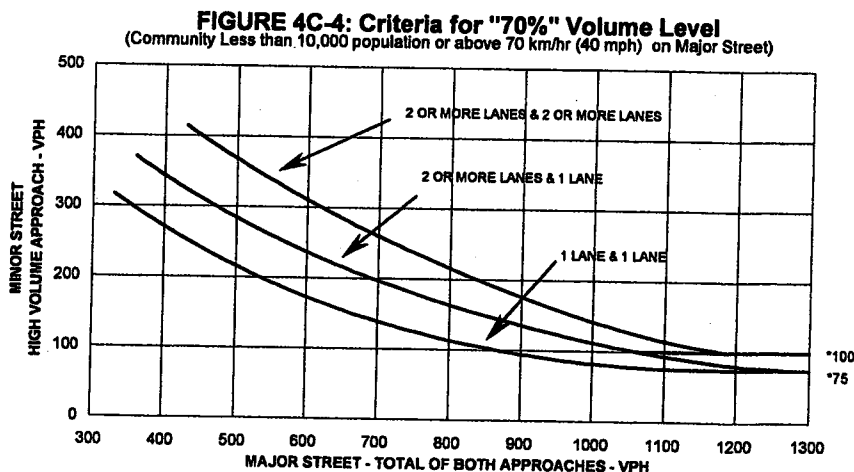
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		129
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	151	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sim  
Date: 11/5/08

Major Street: Purchase St / SARB  
Minor Street: Pearl St

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	1200	228			
	1300	239			
	1600	213			
	1700	333			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	1700	333			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students: <input type="text"/>	Hour: <input type="text"/>
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes: <input type="text"/>	Gaps: <input type="text"/>
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: Seaport Blvd.

Engineer: A. Siu  
Date: 11/5/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1100	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	866	1105	914	938	1205	1072	1205	1364
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	850	960	768	460	652	768	911	955

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1100	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	866	1105	914	938	1205	1072	1205	1364
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	850	960	768	460	652	768	911	955

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: Seaport Blvd

Engineer: A. Sin  
Date: 11/5/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

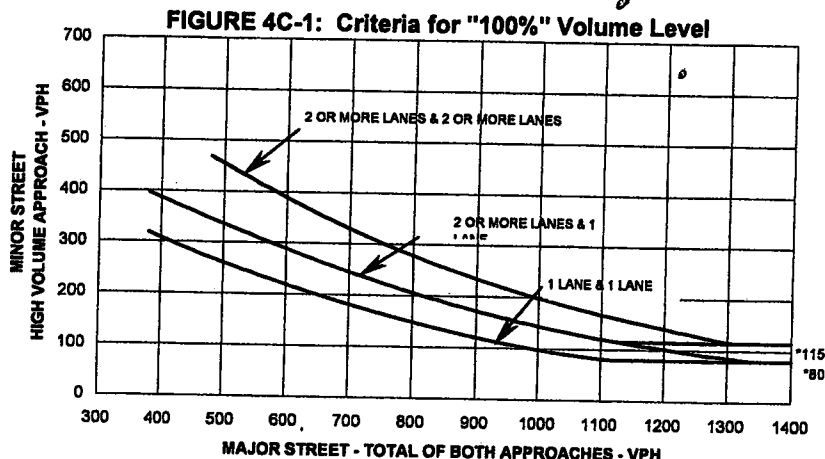
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

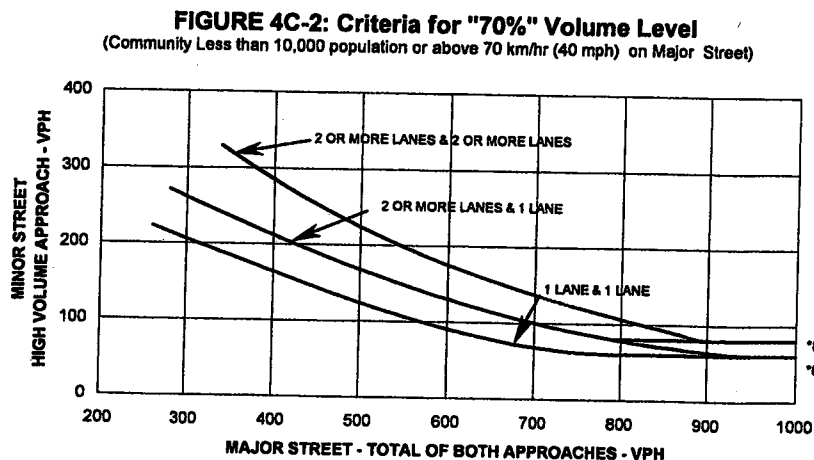
Plot four volume combinations on the applicable figure below.

\* All points above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1105	960
1400	1205	652
1600	1205	911
1700	1364	955



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: Seaport Blvd.

Engineer: A. Siu  
Date: 11/5/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	1369	955

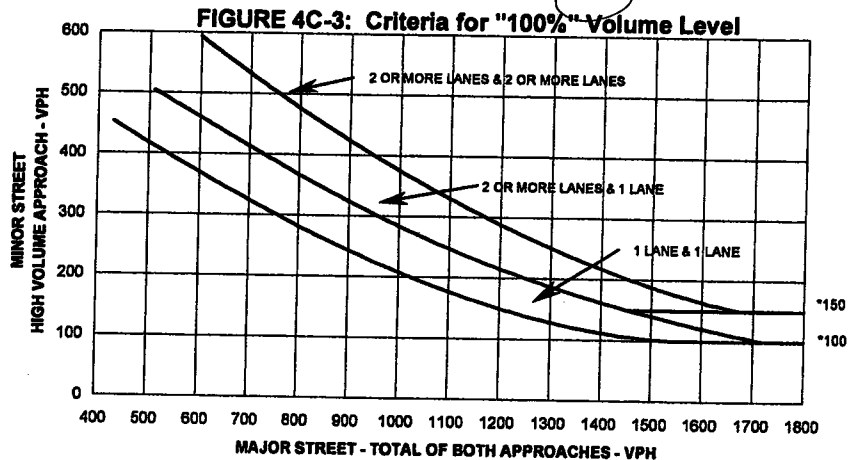
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

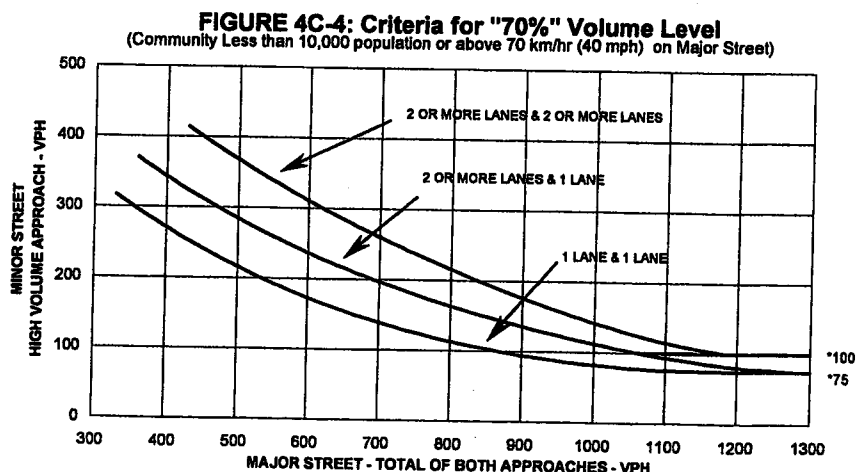
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		955
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	2730	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 11/5/08

Major Street: Atlantic Ave.  
Minor Street: Seaport Blvd.

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	<u>700</u>	<u>317</u>			
	<u>800</u>	<u>419</u>			
	<u>1200</u>	<u>343</u>			
	<u>1400</u>	<u>349</u>			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				<input checked="" type="checkbox"/>	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3  
Lanes: 2

Critical Approach Speed: 30

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/5/08  
Major Street: Purchase St / ASB  
Minor Street: Oliver St. / I-93 Ramp  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1200	1400	1500	1600	1700
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420	574	797	805	870	930	989	882	980
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	428	445	364	211	246	237	203	243

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☒ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1200	1400	1500	1600	1700
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630	574	797	805	870	930	989	882	980
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	428	445	364	211	246	237	203	243

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/5/08  
Major Street: Purchase / SARB Lanes: 2 Critical Approach Speed: 36  
Minor Street: Oliver, I-93 Ramps Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

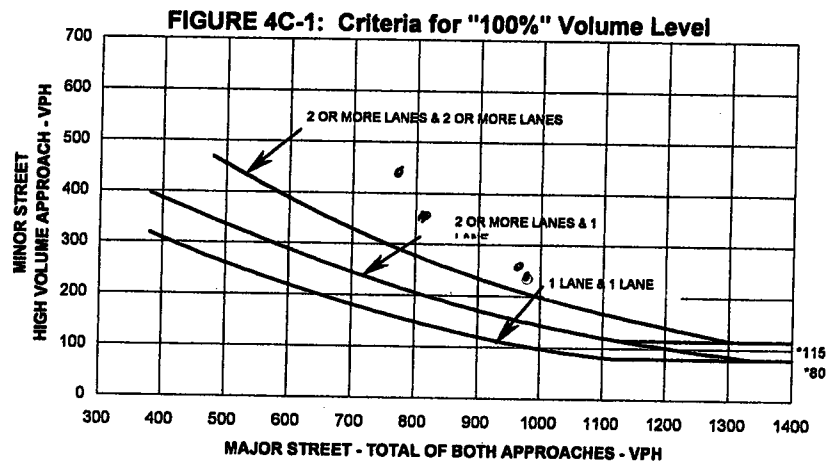
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

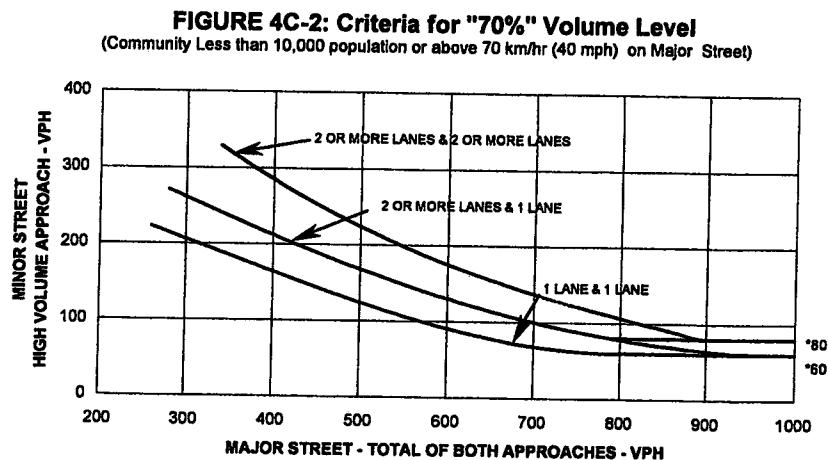
Plot four volume combinations on the applicable figure below.

*All points above line*

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	797	445
900	805	364
1500	989	237
1700	980	243



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/5/08

Major Street: Purchase St / SASS  
Minor Street: Oliver / ramps

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
800	797	445

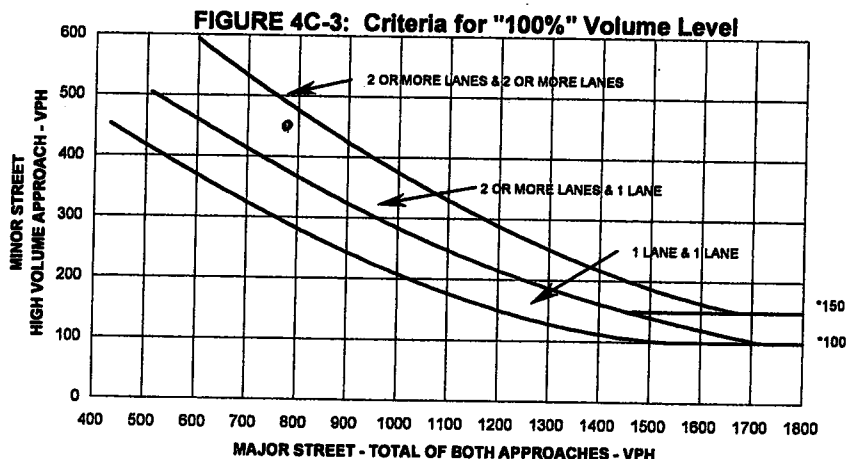
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

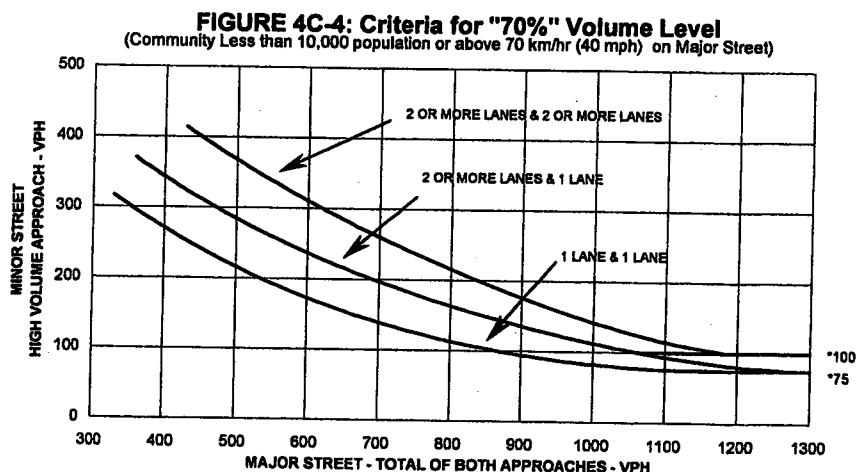
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		445
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		1616
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sim  
County: Suffolk Date: 11/5/08  
Major Street: Purchase St / SASHB Lanes: 2 Critical Approach Speed: 30  
Minor Street: Oliver, Ramps Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	476			
	12 <sup>00</sup>	408			
	13 <sup>00</sup>	364			
	17 <sup>00</sup>	445			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		476			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/5/08  
Major Street: Purchase St. / SASB  
Minor Street: Diver, Ramps  
Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)			X			
	Warrant 1, Condition B (80% satisfied)				X		
	Warrant 4, Pedestrian Volume at 80% of volume requirements: 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour			X		X	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		0		X

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume:	X		X	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant: 1 2 3 Satisfied?: Y Y Y	X			
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		NO	DATA	← Hour ← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:	X		X	
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:	Y			
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:	X			
	Minor Street:				

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/5/08  
Major Street: Atlantic Ave  
Minor Street: High St  
Lanes: 2 Critical Approach Speed: 36  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	776	708	633	626	628	624	648	741
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	152	104	126	117	113	107	127	149

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☒ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	776	708	633	626	628	624	648	741
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	152	104	126	117	113	107	127	149

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sin  
Date: 11/5/08  
Major Street: Atlantic Ave  
Minor Street: High St.  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 36

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

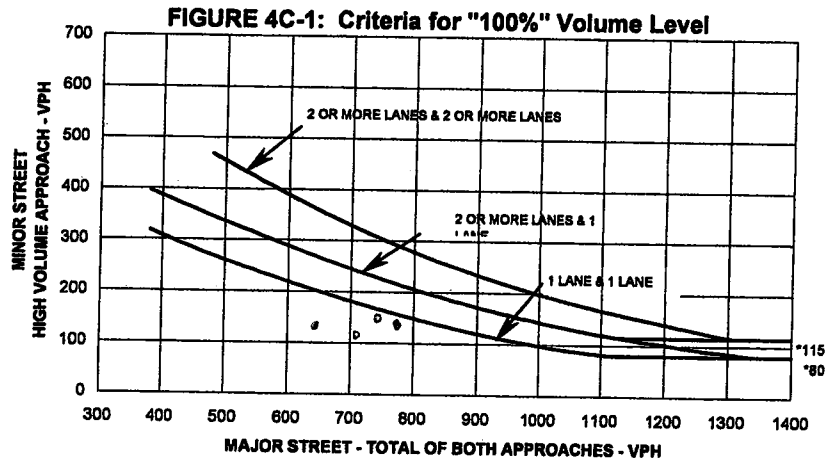
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

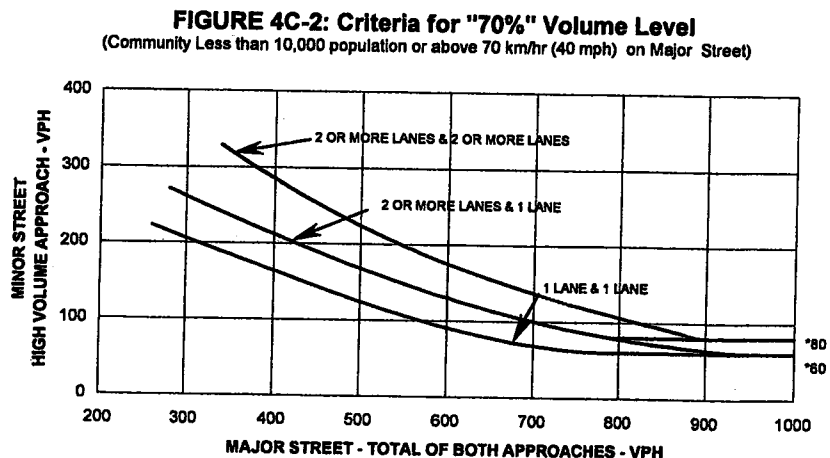
Plot four volume combinations on the applicable figure below.

*All points below line*

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	776	152
9 <sup>00</sup>	708	104
16 <sup>00</sup>	648	127
17 <sup>00</sup>	741	149



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/5/00  
Major Street: Atlantic Ave  
Minor Street: High St.  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
<u>7:00</u>	<u>7:41</u>	<u>1:49</u>

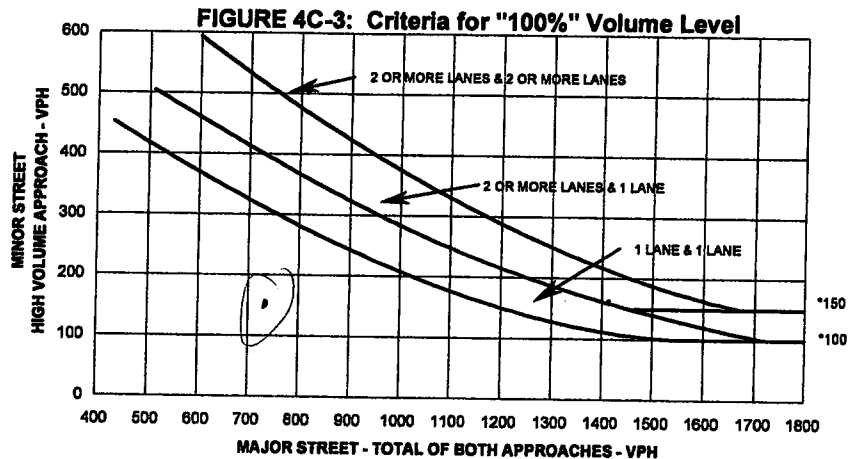
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	<u>1</u>	<u>2</u>
Delay Criteria*	<u>4.0</u>	<u>5.0</u>
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

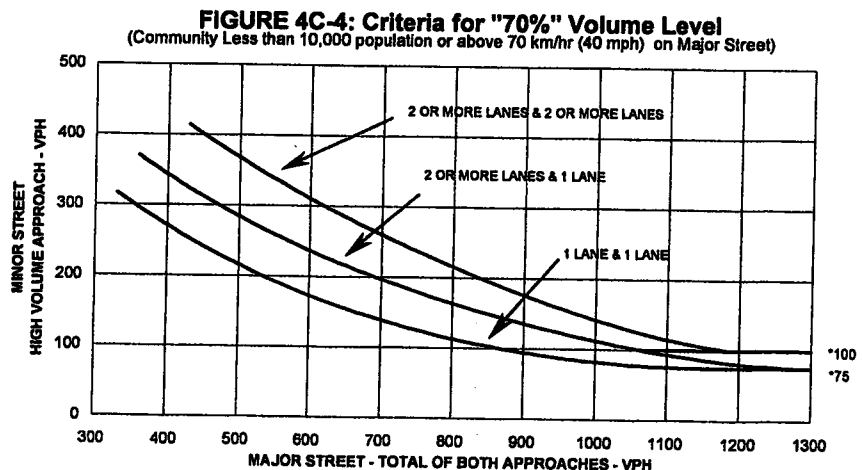
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	<u>1</u>	<u>2</u>
Volume Criteria*	<u>100</u>	<u>150</u>
Volume*		<u>149</u>
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	<u>3</u>	<u>4</u>
Volume Criteria*	<u>650</u>	<u>800</u>
Volume*	<u>901</u>	
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave.  
Minor Street: High St.

Engineer: A. Sim  
Date: 11/5/08  
Lanes: 2  
Lanes: 2 Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	800	558			
	1200	702			
	1300	611			
	1700	549			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		702			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SASB  
Minor Street: High St

Engineer: A. Siu  
Date: 11/5/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1049	883	813	767	874	916	856	995
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	237	179	200	213	175	175	191	279

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1049	883	813	767	874	916	856	995
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	237	179	200	213	175	175	191	279

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/5/06

Major Street: Purchase / SARB  
Minor Street: High St.

Lanes: 2 Critical Approach Speed: 36  
Lanes: 2

## Volume Level Criteria

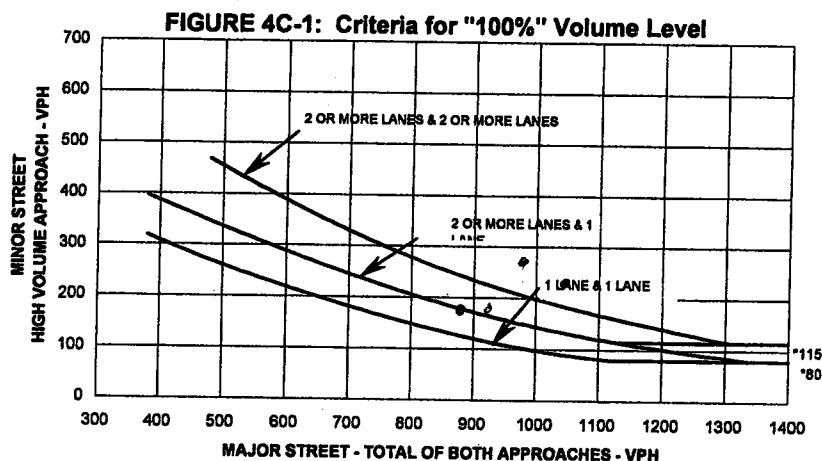
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

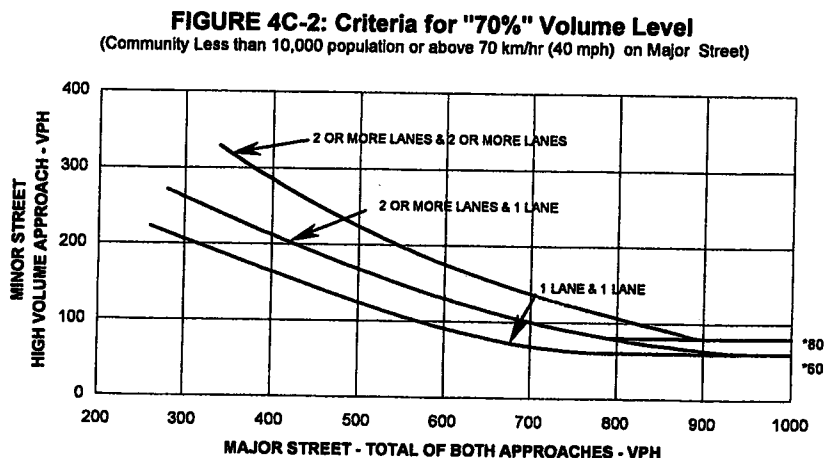
Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1649	237
900	883	179
1500	910	175
1700	495	279



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/5/08

Major Street: Purchase St / SARB  
Minor Street: High St.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Plot volume combination on the applicable figure below.

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

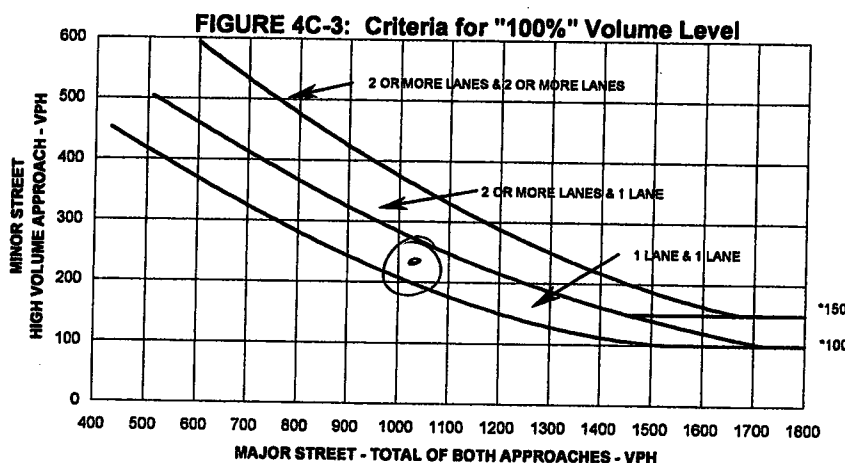
Peak Hour		
<u>800</u>	<u>1649</u>	<u>237</u>

### Criteria

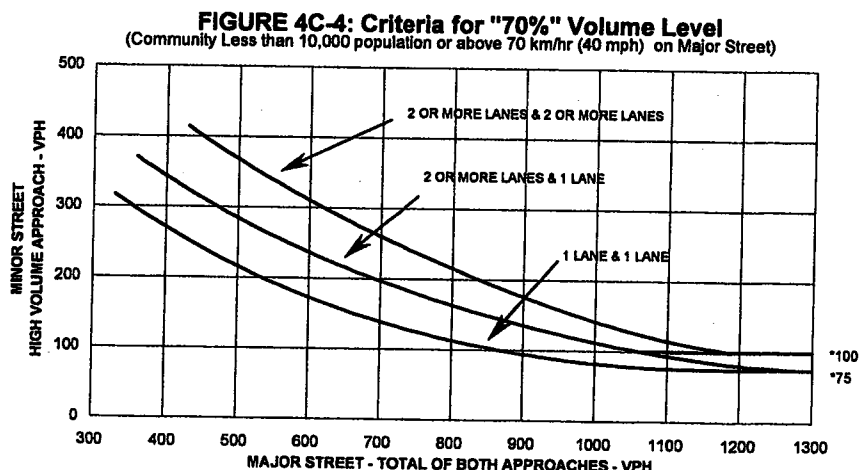
1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		<u>237</u>
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	<u>1786</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sim  
Date: 11/5/08  
Major Street: Purchase St / SASSB  
Minor Street: High St.  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	625			
	12 <sup>00</sup>	867			
	13 <sup>00</sup>	873			
	17 <sup>00</sup>	771			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes:  $\frac{2}{2}$  Critical Approach Speed: 30

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## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / ASB  
Minor Street: Broad St.

Engineer: A. Siu  
Date: 11/5/00  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1100	1200	1400	1500	1600	1700
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1172	1046	767	781	866	848	844	847
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	70	70	120	150	125	120	109	132

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1100	1200	1400	1500	1600	1700
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1172	1046	767	781	866	848	844	847
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	70	70	120	150	125	120	109	132

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase / SARB  
Minor Street: Brook St.

Engineer: A. Sin  
Date: 11/5/08  
Lanes: 2 Critical Approach Speed: 36  
Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

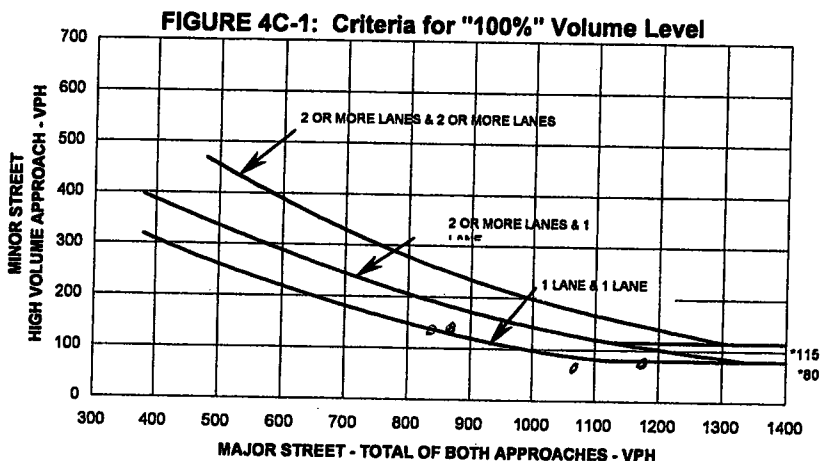
## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

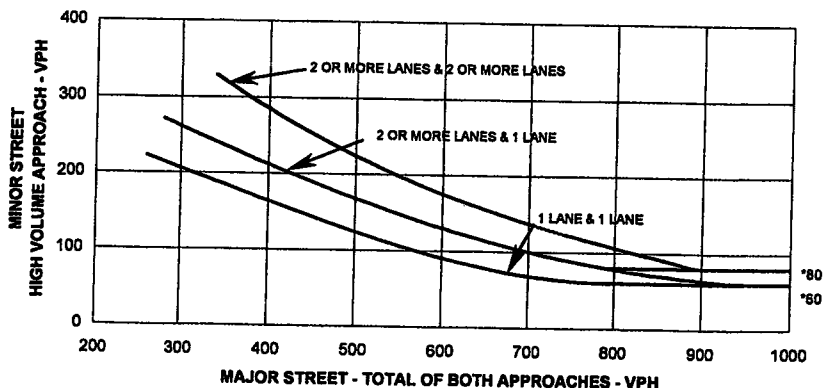
Plot four volume combinations on the applicable figure below.

All points below line



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

**FIGURE 4C-2: Criteria for "70%" Volume Level**  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1172	70
900	1046	70
1400	860	125
1700	847	132



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/5/08

Major Street: Purchase St / SARB  
Minor Street: Broad St.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
800	1172	70

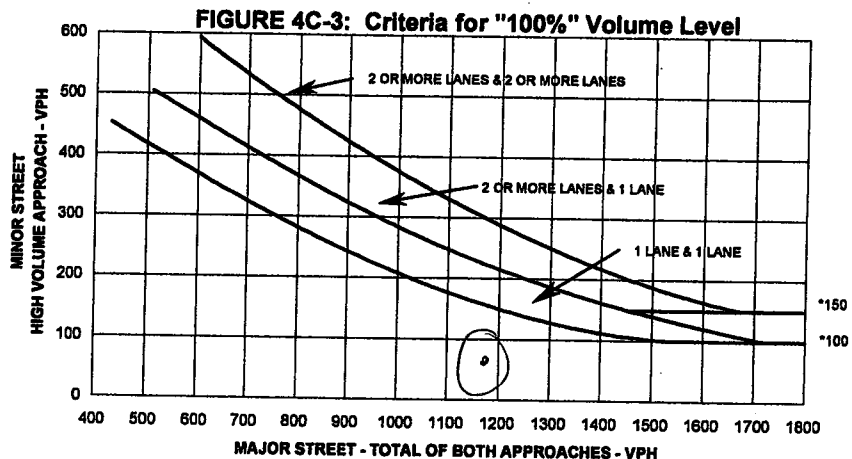
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

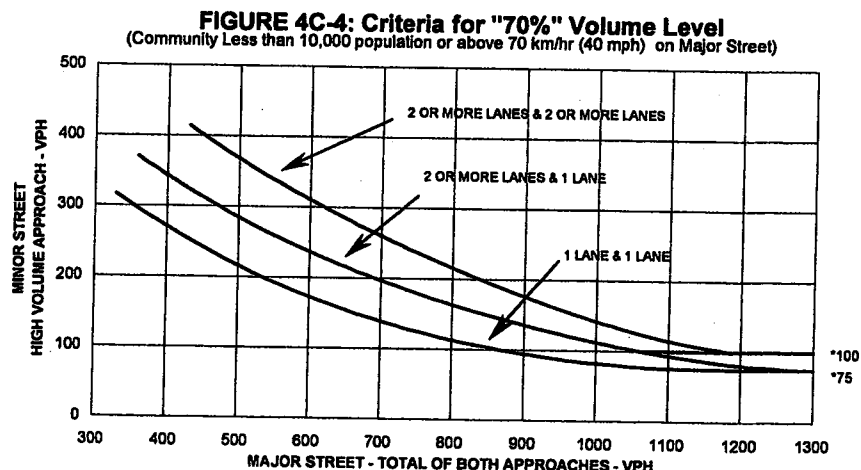
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	70	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1242	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Silva  
Date: 11/5/00  
Major Street: Purchase St / SASSB  
Minor Street: Broad St.  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	800	224			
	1200	216			
	1300	226			
	1700	190			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/6/08  
Major Street: Atlantic Ave Lanes: 2 Critical Approach Speed: 36  
Minor Street: East India Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1000	1100	1200	1400	1600	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more		800	900	1000	1100	1200	1400	1600	1700
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	809	674	679	683	657	704	816	968
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	38	35	24	30	39	28	36	30

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☐ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1000	1100	1200	1400	1600	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more		800	900	1000	1100	1200	1400	1600	1700
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	809	674	679	683	657	704	816	968
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	38	35	24	30	39	28	36	30

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sin  
Date: 11/6/08

Major Street: Atlantic Ave  
Minor Street: East India

Lanes: 2  
Lanes: 1

Critical Approach Speed: 36

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

☐ 70% ☒ 100%

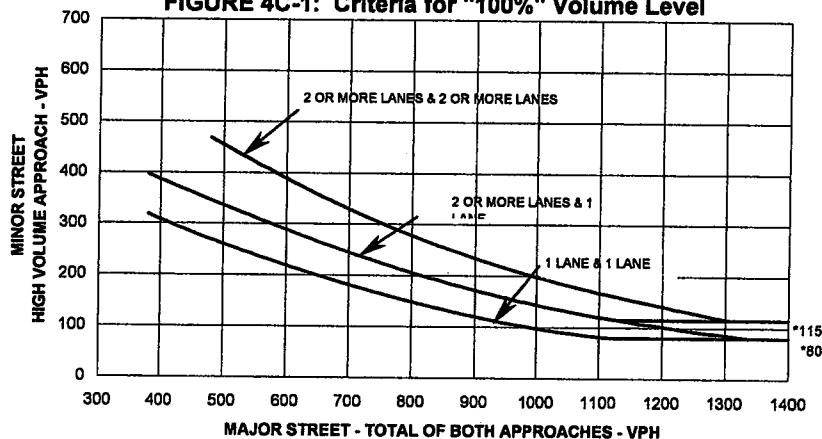
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

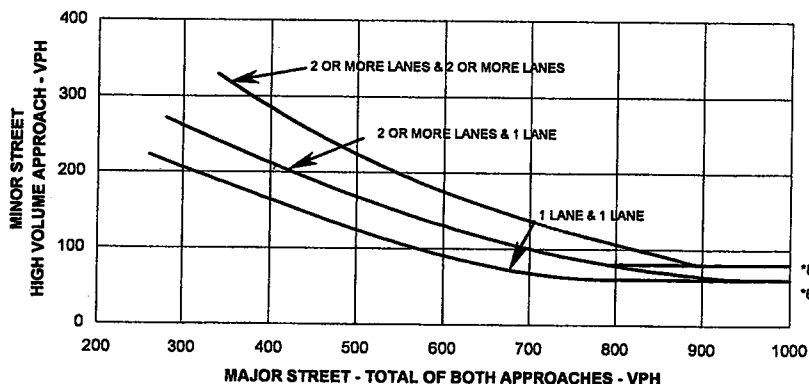
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	809	38
14 <sup>00</sup>	704	28
16 <sup>00</sup>	816	36
17 <sup>00</sup>	968	30

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: East India

Engineer: A. Siu  
Date: 11/6/08  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
<u>1700</u>	<u>968</u>	<u>30</u>

#### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

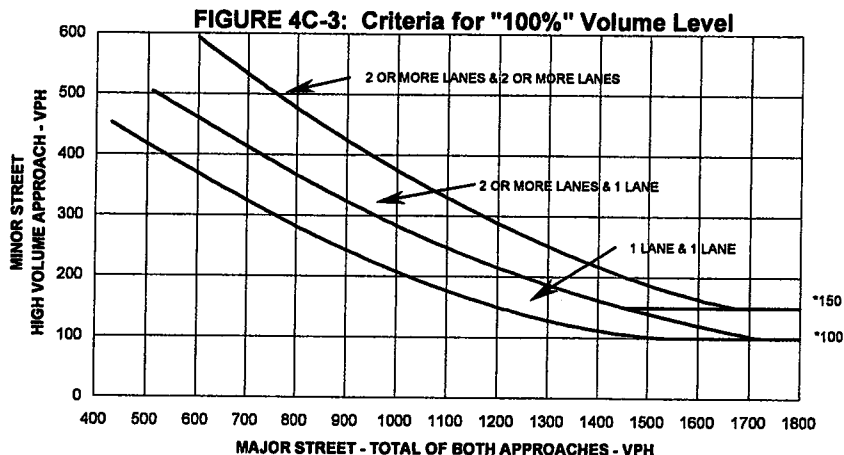
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	<u>30</u>	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

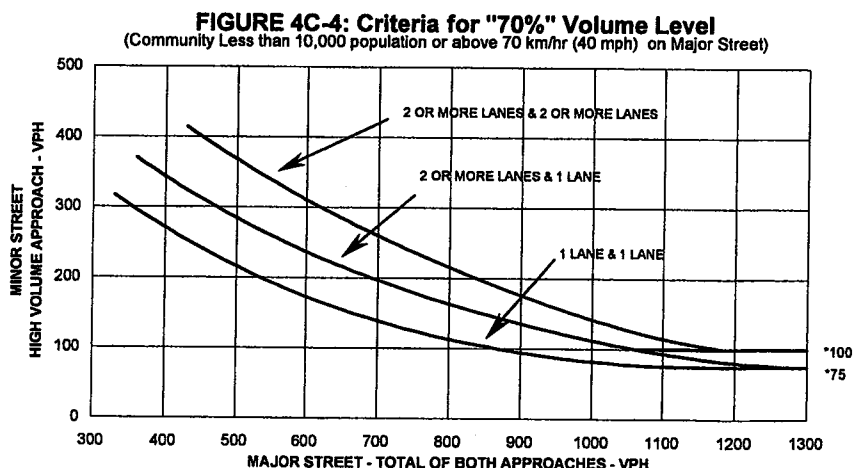
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	<u>998</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave.  
Minor Street: East India

Engineer: A. Sim  
Date: 11/16/00  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	800	71			X
	900	81			
	1200	72			
	1300	65			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/6/08  
Major Street: Atlantic Ave Lanes: 2 Critical Approach Speed: 30  
Minor Street: East India Lanes: 1

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour						
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:			<u>0</u>	<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria					Met?		Fulfilled?	
					Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume: <u>998</u>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant:	1	2	3		
		Satisfied?:		<u>N</u>	<u>N</u>	<u>N</u>	<input checked="" type="checkbox"/>	
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)							← Hour	
								← Volume

Characteristics of Major Routes				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.				Major Street:			
				Minor Street:			
2. Rural or suburban highway outside of, entering, or traversing a city.				Major Street:			
				Minor Street:			
3. Appears as a major route on an official plan.				Major Street:			
				Minor Street:			

### CONCLUSIONS

Warrants Satisfied: 

--	--	--	--	--	--	--	--

Remarks: \_\_\_\_\_  
\_\_\_\_\_



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/6/08  
Major Street: Purchase St / SASB  
Minor Street: India St  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1200	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	695	1040	745	669	669	626	661	696
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	171	211	184	145	141	153	176	175

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1200	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	695	1040	745	669	669	626	661	696
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	171	211	184	145	141	153	176	175

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/16/08

Major Street: Purchase / SARB  
Minor Street: India St.

Lanes: 3  
Lanes: 2 Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

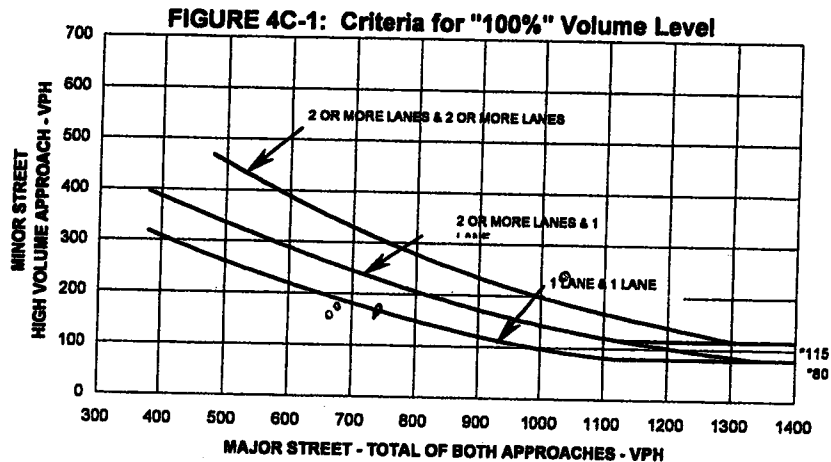
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

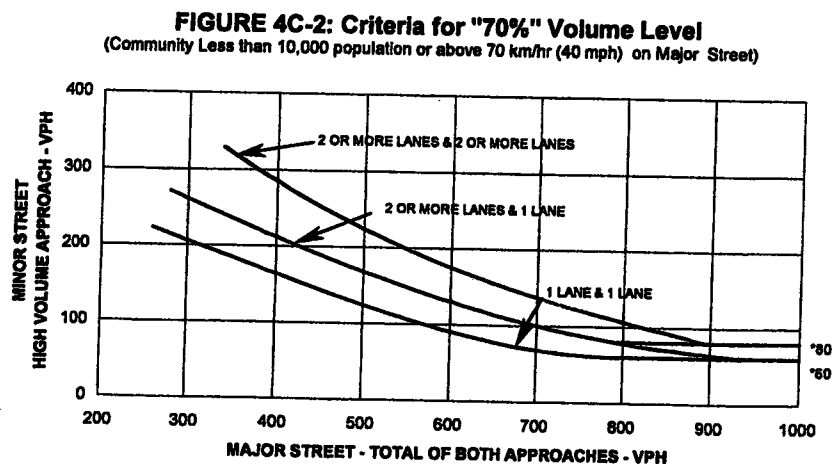
Plot four volume combinations on the applicable figure below.

All points below line

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	695	171
800	1040	211
900	745	184
1700	690	175



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SARB  
Minor Street: India St

Engineer: A. Siu  
Date: 11/6/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
<u>0800</u>	<u>1640</u>	<u>21</u>

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

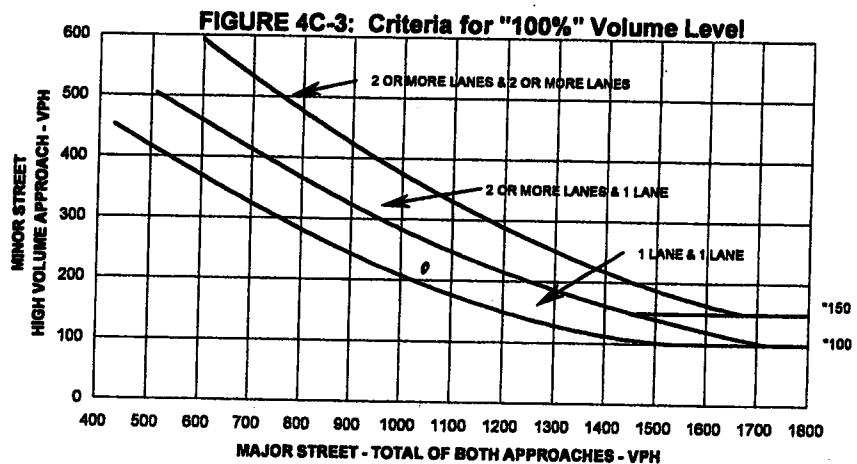
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		<u>211</u>
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

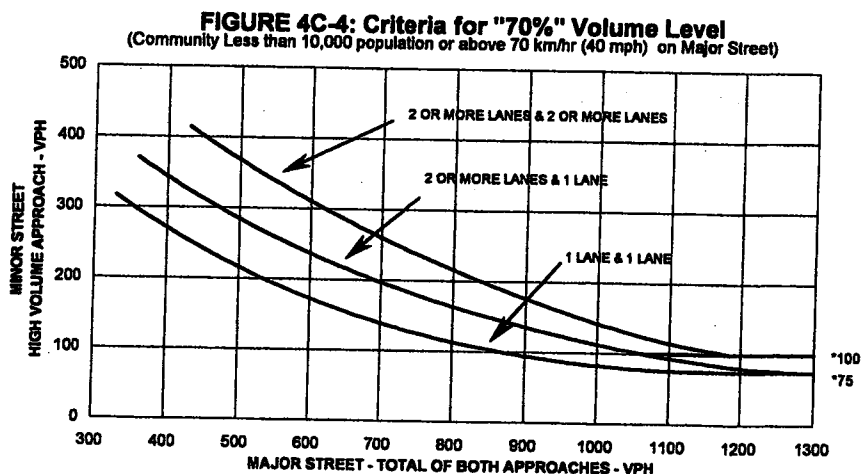
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	<u>1251</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SARB  
Minor Street: India St.

Engineer: A. Sim  
Date: 11/6/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	259			
	12 <sup>00</sup>	192			
	13 <sup>00</sup>	180			
	17 <sup>00</sup>	159			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		259			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3  
Lanes: 2

Critical Approach Speed: 30

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: Milk St.

Engineer: A. Siu  
Date: 11/6/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420	582	579	547	544	527	583	657	774
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	262	218	173	155	154	166	200	249

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630	582	579	547	544	527	583	657	774
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	262	218	173	155	154	166	200	249

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: Milk St.

Engineer: A. Su  
Date: 11/6/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

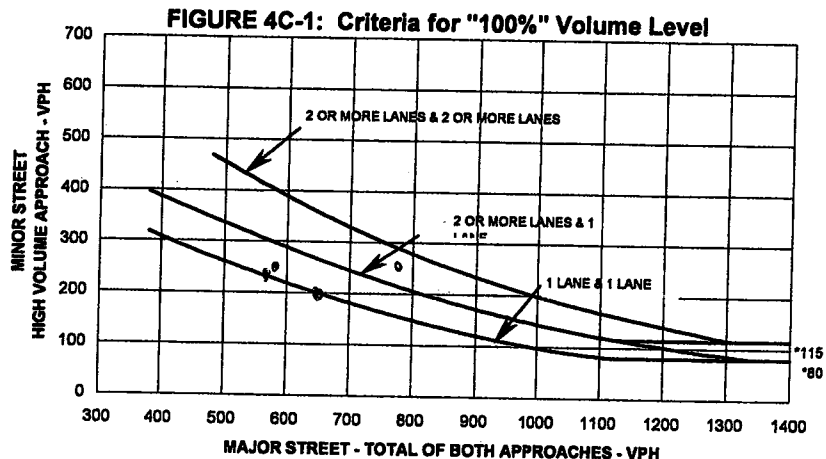
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

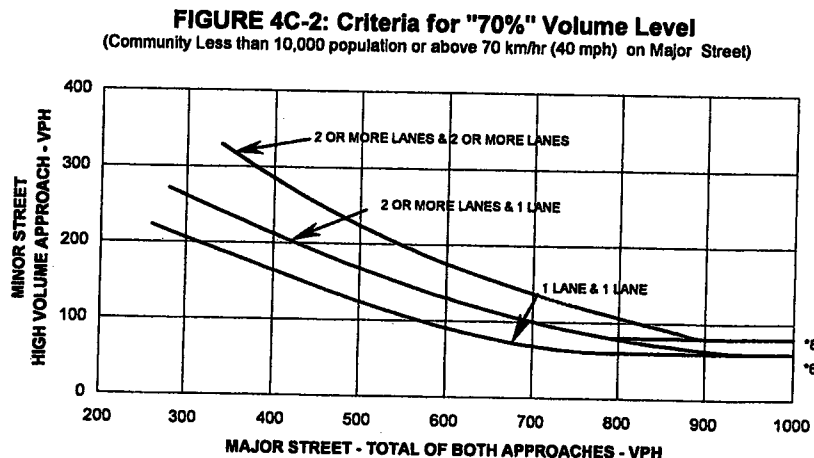
Plot four volume combinations on the applicable figure below.

\* All points below line

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	582	262
900	579	218
1600	657	200
1700	774	249



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: MIL ST.

Engineer: A. Siu  
Date: 11/6/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
<u>1700</u>	<u>774</u>	<u>249</u>

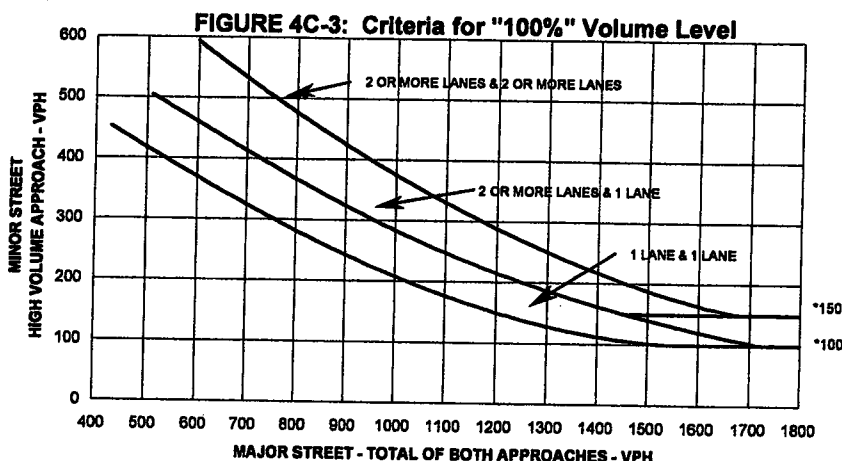
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

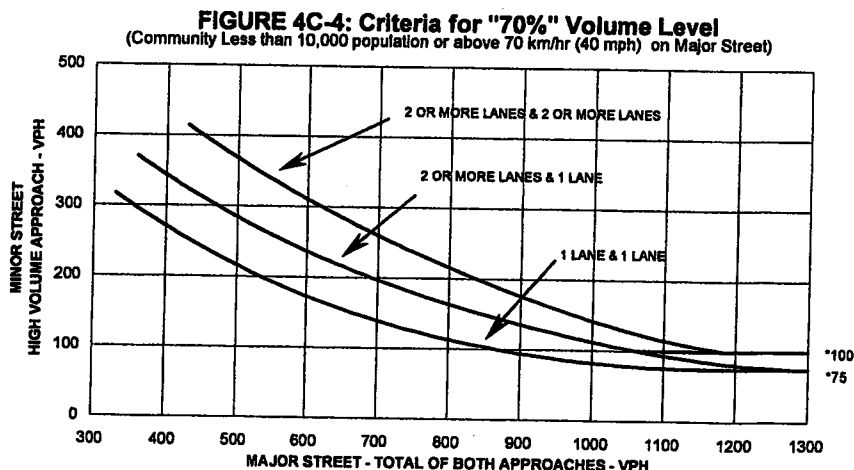
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		<u>249</u>
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	<u>1136</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave.  
Minor Street: Milk St.

Engineer: A. Silva  
Date: 11/6/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	1200	257			
	1300	383			
	1500	249			
	1700	297			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Engineer: A. Siu  
Date: 11/10/08  
Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

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## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SASB  
Minor Street: Milk St.

Engineer: A. Siu  
Date: 11/6/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 36

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1400	1600	1700
Approach Lanes	100%	70%	100%	70%								
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	775	1208	837	653	644	687	675	712
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	65	123	105	138	140	143	189	221

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1400	1600	1700
Approach Lanes	100%	70%	100%	70%								
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	775	1208	837	653	644	687	675	712
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	65	123	105	138	140	143	189	221

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase / SARB  
Minor Street: Milk St

Engineer: A. Sin  
Date: 11/6/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

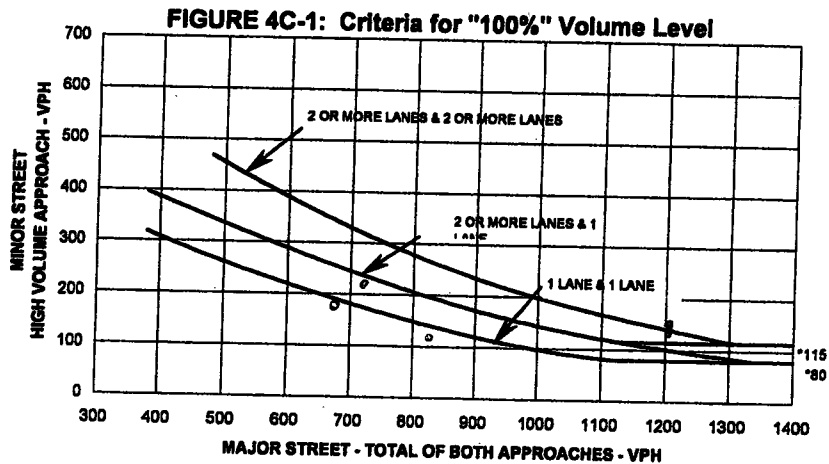
1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

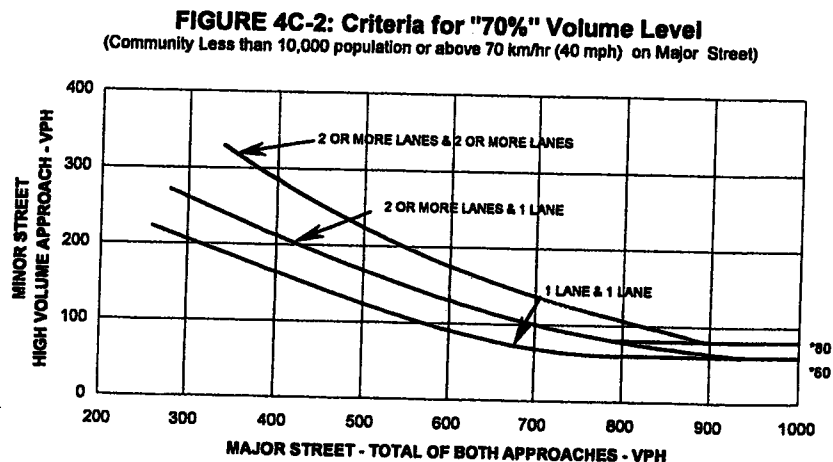
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☒ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1208	123
900	837	105
1600	675	189
1700	712	221

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SASB  
Minor Street: Milk St

Engineer: A. Siu  
Date: 11/6/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
<u>8:00</u>	<u>1208</u>	<u>123</u>

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

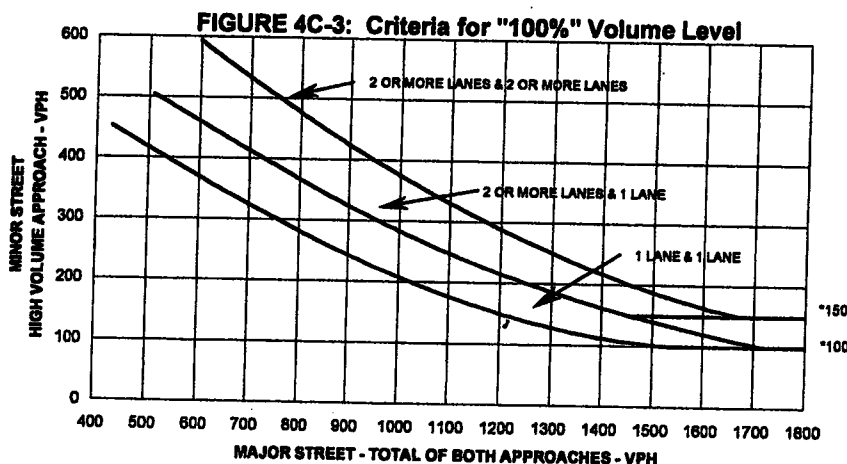
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		<u>123</u>
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

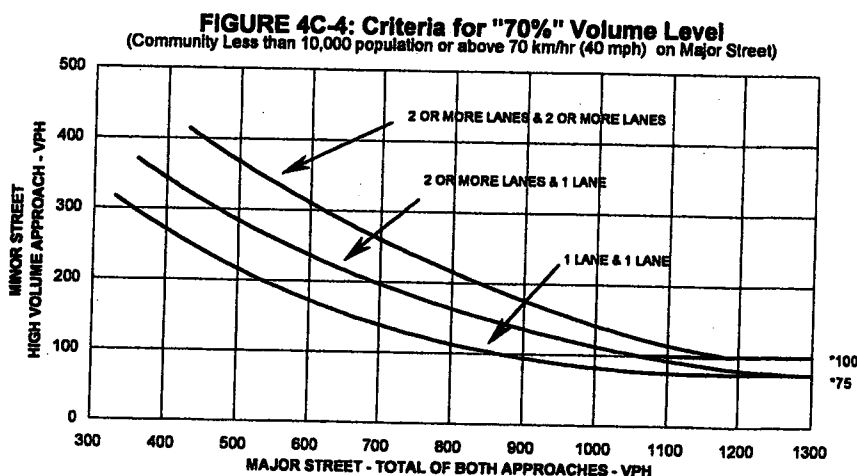
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	<u>133</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SARB  
Minor Street: Milk St

Engineer: A. Siu  
Date: 11/16/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8:00	216			
	12:00	267			
	13:00	261			
	17:00	255			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		267			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St. / SASB  
Minor Street: Milk St.

Engineer: A. Siu  
Date: 11/6/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)					
	Warrant 1, Condition B (80% satisfied)					
	Warrant 4, Pedestrian Volume at 80% of volume requirements: 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour		X		X	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months:					X

## WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria			Met?		Fulfilled?	
			Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: <u>1337</u>	X			X
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant: <u>1</u> <u>2</u> <u>3</u> Satisfied?: <u>N</u> <u>N</u> <u>N</u>		X		
	2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	<u>NO</u> <u>DATA</u>				
			← Hour			
			← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

## CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_  
\_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: State St

Engineer: A. Siu  
Date: 11/7/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					800	900	1000	1100	1400	1500	1600	1700
	1	2 or more										
Approach Lanes	100%	70%	100%	70%								
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	638	611	593	609	690	617	808	1021
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	75	84	93	85	114	94	113	121

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					800	900	1000	1100	1400	1500	1600	1700
	1	2 or more										
Approach Lanes	100%	70%	100%	70%								
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	638	611	593	609	690	617	808	1021
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	75	84	93	85	114	94	113	121

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Silva  
Date: 11/7/08  
Major Street: Atlantic Ave  
Minor Street: State St  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

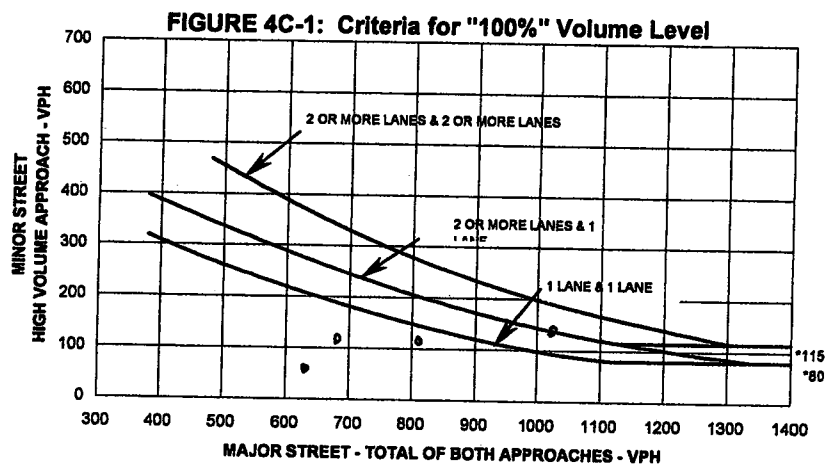
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

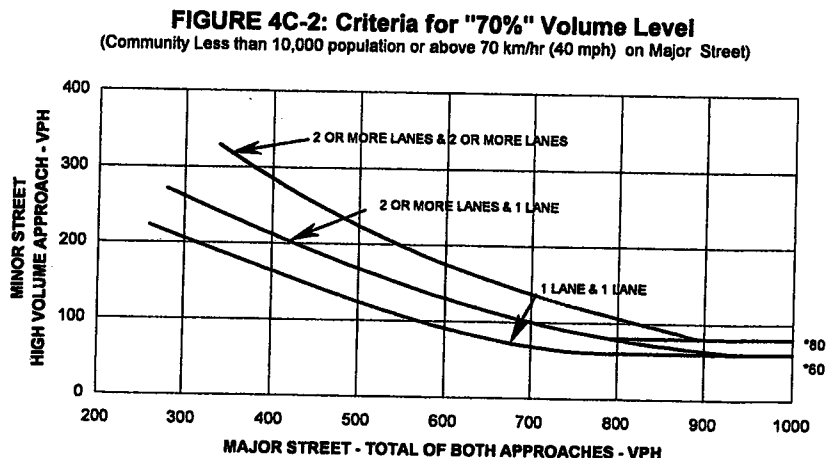
Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	638	75
1400	690	114
1600	808	113
1700	1021	121



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave  
Minor Street: State St

Engineer: A. Siu  
Date: 11/7/00  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	1021	121

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

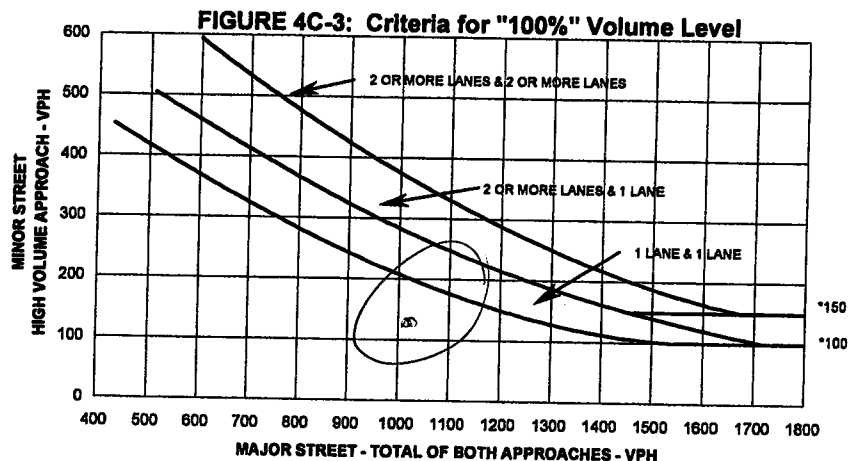
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		121
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

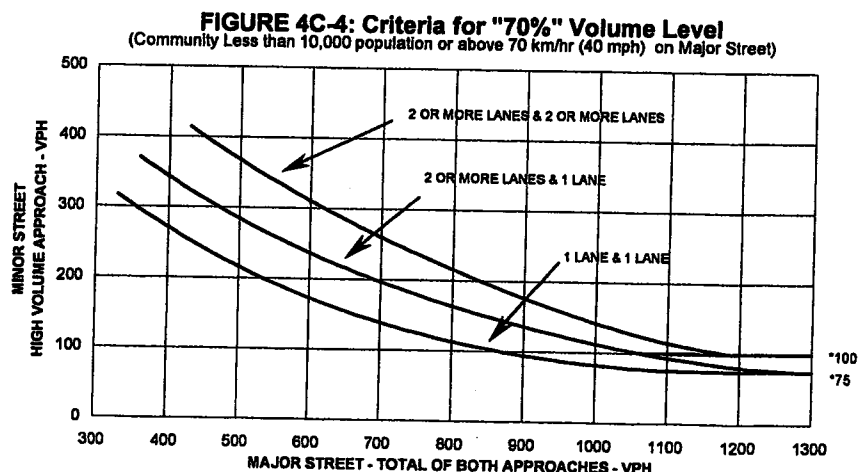
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1142	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic Ave.  
Minor Street: State St.

Engineer: A. Sim  
Date: 11/7/08  
Lanes: 2  
Lanes: 2 Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	12 <sup>00</sup>	555			
	13 <sup>00</sup>	392			
	14 <sup>00</sup>	358			
	17 <sup>00</sup>	314			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		555			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/7/08

Major Street: Purchase St / ASB  
Minor Street: State St.

Lanes: 3  
Lanes: 2 Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1400	1600	1700
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1215	1720	1336	951	905	915	843	866
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	189	204	210	225	223	264	249	240

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1400	1600	1700
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1215	1720	1336	951	905	915	843	866
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	189	204	210	225	223	264	249	240

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/7/08

Major Street: Purchase / SARB  
Minor Street: State St.

Lanes: 3  
Lanes: 2

Critical Approach Speed: 36

### Volume Level Criteria

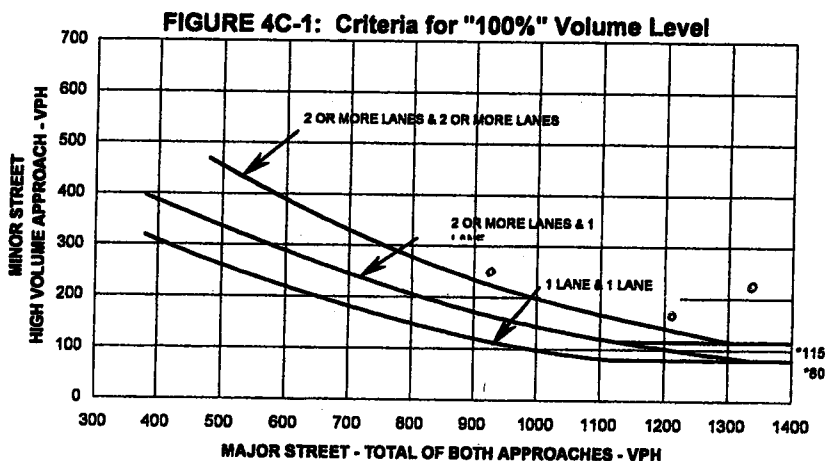
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

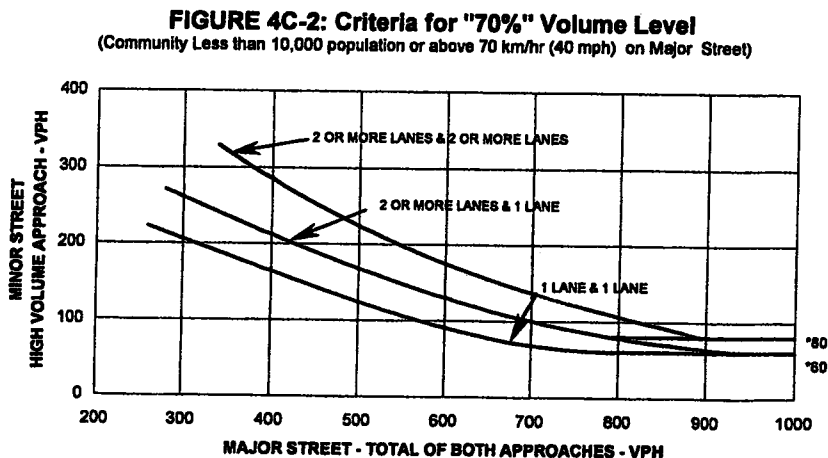
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	125	189
800	172	204
900	133	210
1400	918	264

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SASB  
Minor Street: State St

Engineer: A. Siu  
Date: 11/7/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
<u>800</u>	<u>720</u>	<u>209</u>

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

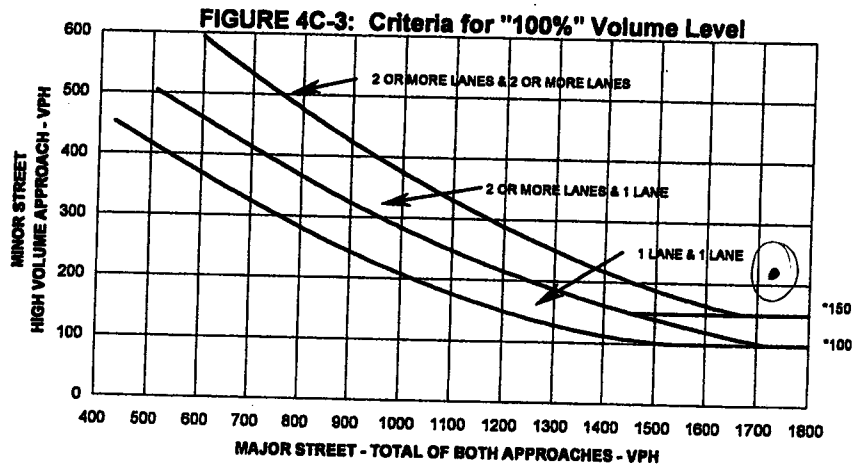
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		<u>264</u>
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

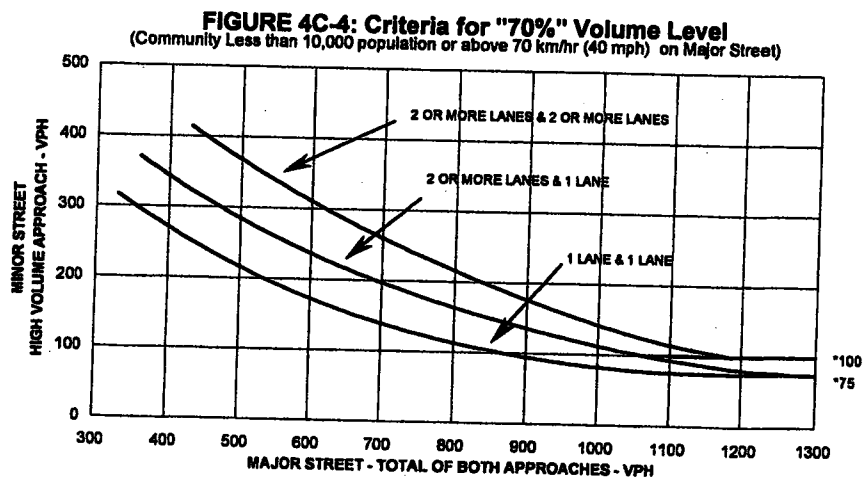
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	<u>1924</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SASH  
Minor Street: State St.

Engineer: A. Sim  
Date: 11/7/08  
Lanes: 3  
Lanes: 2 Critical Approach Speed: 30

## WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	12 <sup>00</sup>	518			
	13 <sup>00</sup>	40+			
	14 <sup>00</sup>	306			
	15 <sup>00</sup>	40			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		518			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

## WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

## WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



Lanes: 3  
Lanes: 2      Critical Approach Speed: 30

TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/7/08  
Major Street: Atlantic Ave Lanes: 2 Critical Approach Speed: 36  
Minor Street: Atlantic / Mercantile Lanes: 2

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					800	900	1100	1200	1400	1500	1600	1700
	1		2 or more									
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	476	456	439	470	518	454	663	887
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	277	228	192	220	256	221	226	226

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					800	900	1100	1200	1400	1500	1600	1700
	1		2 or more									
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	476	456	439	470	518	454	663	887
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	277	228	192	220	256	221	226	226

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/7/08  
Major Street: Atlantic Ave  
Minor Street: Atlantic/Mercantile  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

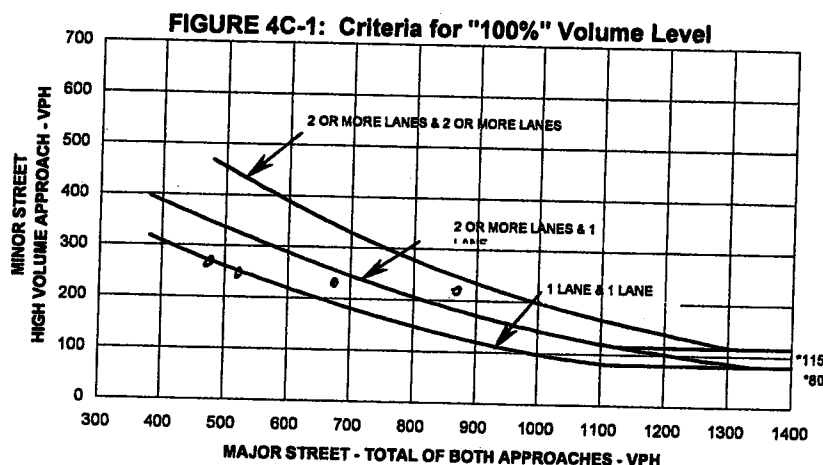
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

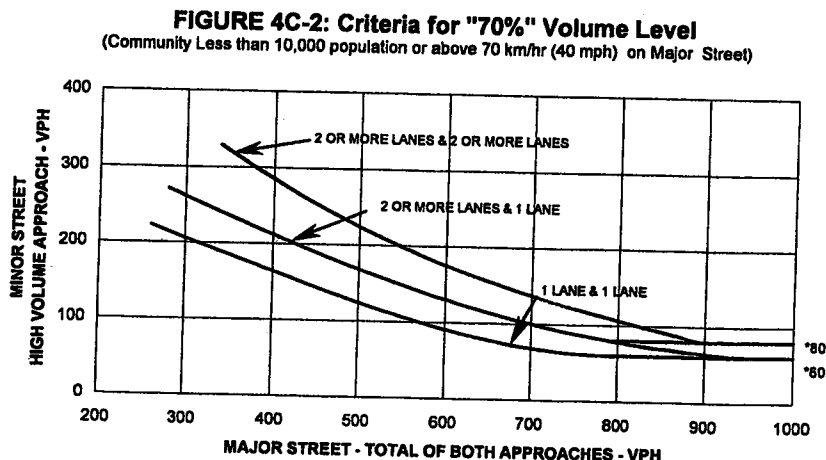
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.



\*Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\*Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	476	277
1400	518	256
1600	663	226
1700	887	226

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/7/08  
Major Street: Atlantic Ave  
Minor Street: Atlantic / Mercantile  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
100	887	226

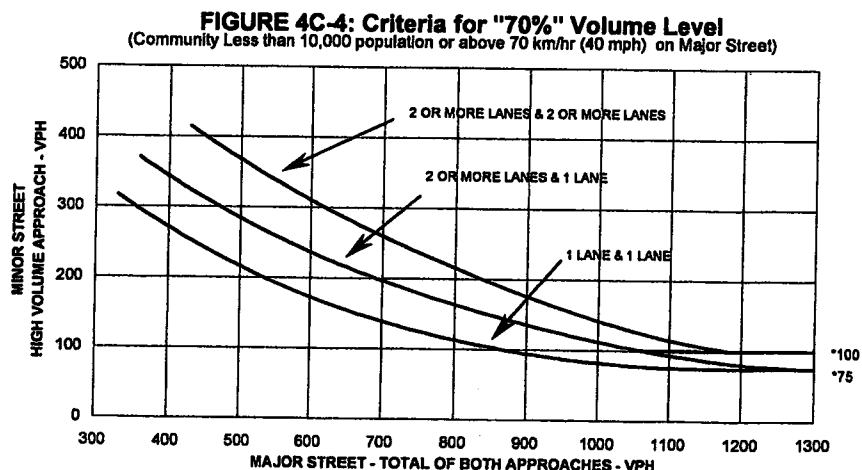
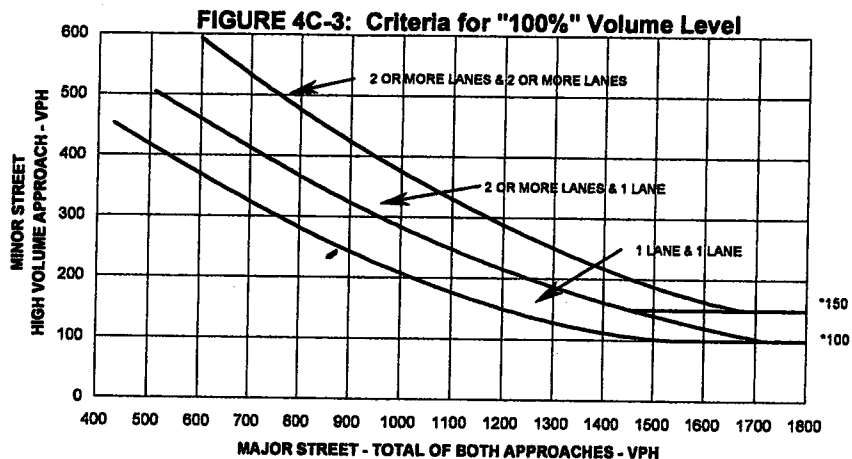
#### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		226
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1308	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sim  
Date: 11/7/08

Major Street: Atlantic Ave.  
Minor Street: Atlantic/Mercantile

Lanes: 2  
Lanes: 2

Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	12 <sup>00</sup>	131			
	14 <sup>00</sup>	108			
	16 <sup>00</sup>	134			
	17 <sup>00</sup>	249			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/7/08

Major Street: Purchase St / ASB  
Minor Street: Mercantile St.

Lanes: 3  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					700	800	900	1000	1100	1200	1400	1700
	1	70%	2 or more	70%								
Approach Lanes	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1180	1686	1272	965	907	799	817	825
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	208	263	207	148	177	190	216	212

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					700	800	900	1000	1100	1200	1400	1700
	1	70%	2 or more	70%								
Approach Lanes	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1180	1686	1272	965	907	799	817	825
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	208	263	207	148	177	190	216	212

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase / SARB  
Minor Street: Mercatile St.

Engineer: A. Siu  
Date: 11/7/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

☐ 70% ☒ 100%

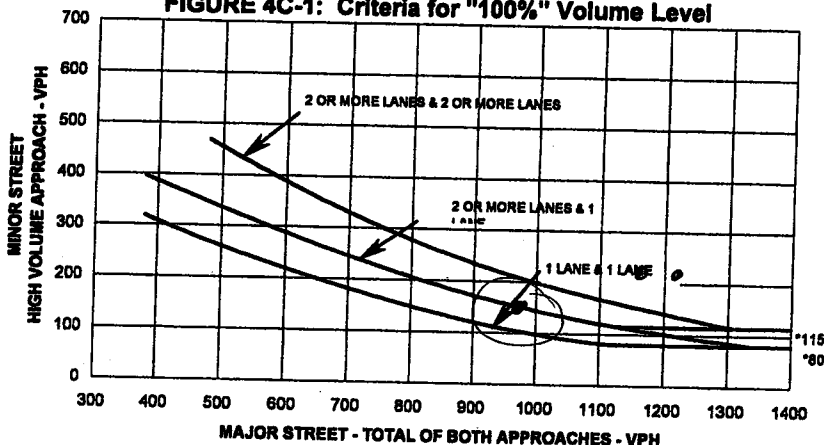
## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

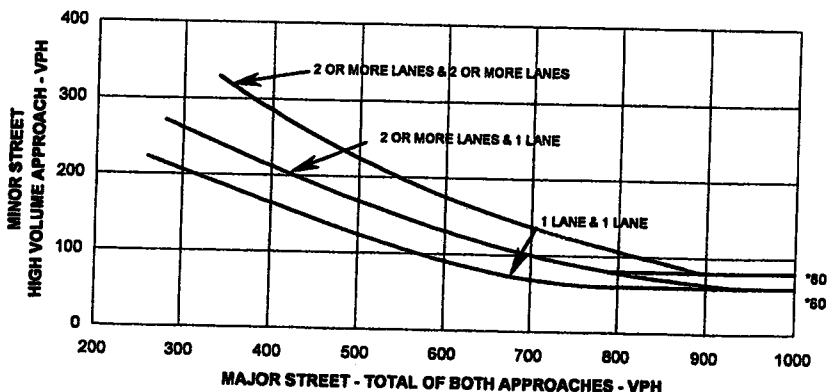
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1180	208
800	1686	263
900	1272	207
1000	965	148



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/7/00

Major Street: Purchase St / SARB  
Minor Street: Mercantile St.

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
800	1686	263

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

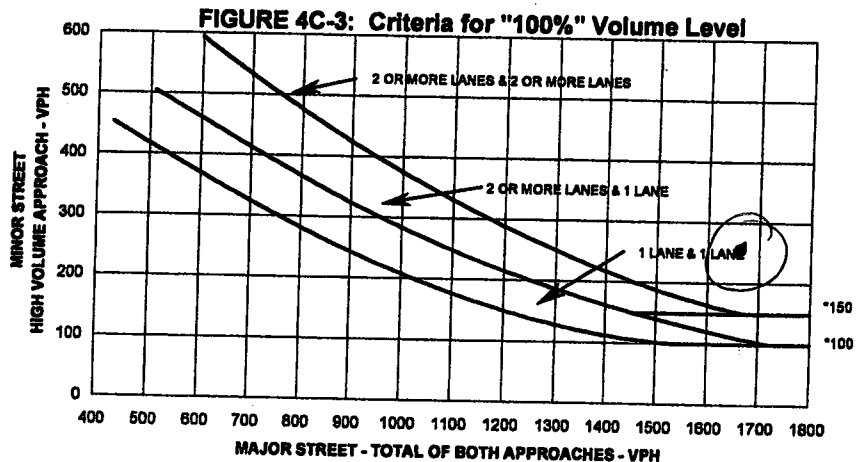
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		263
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

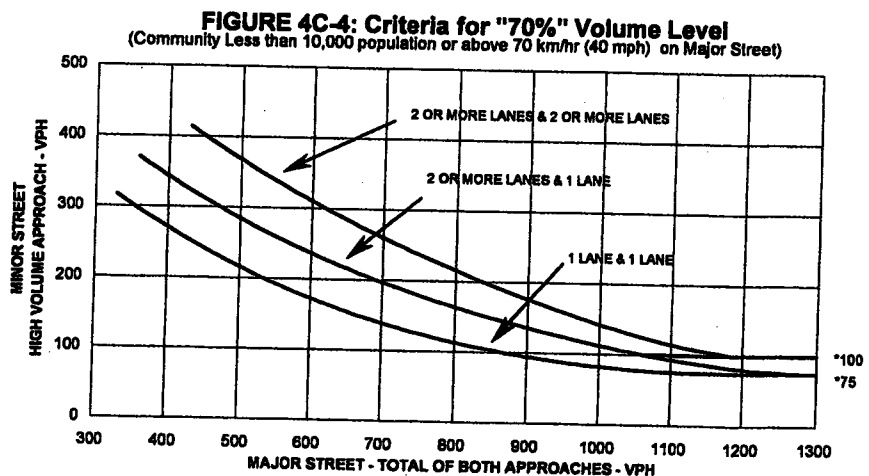
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1949	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SASHB  
Minor Street: Mercantile St.

Engineer: A. Sim  
Date: 11/7/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	800	43			
	1300	32			
	1500	27			
	1700	41			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/7/08  
Major Street: Cross St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Commercial St. Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1000	1200	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	325	350	349	344	438	377	439	559
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	55	35	41	40	26	25	23	38

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1000	1200	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	325	350	349	344	438	377	439	559
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	55	35	41	40	26	25	23	38

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sin  
County: Suffolk Date: 11/7/00  
Major Street: Cross St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Commercial St Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

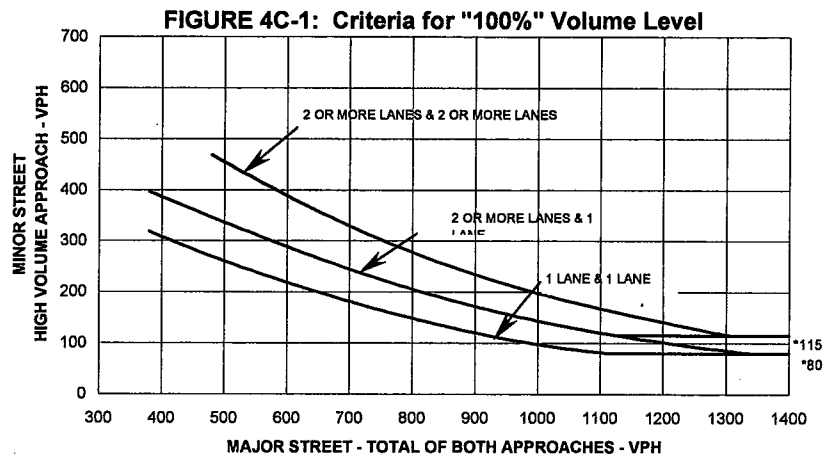
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

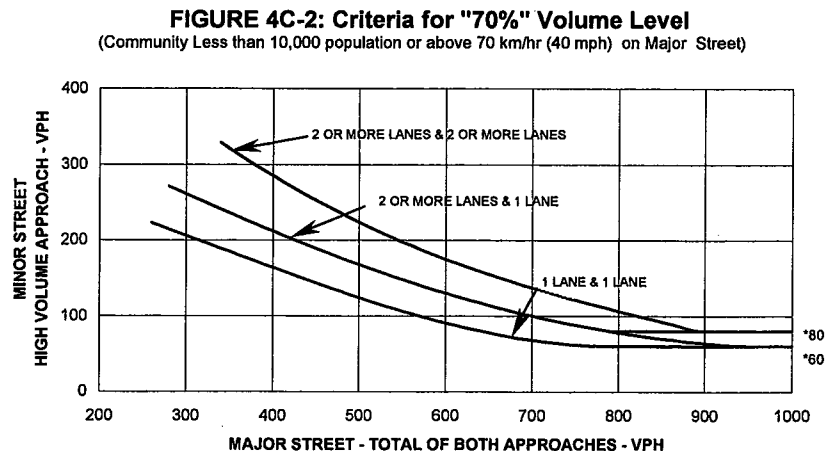
Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

Four Highest Hours	Volumes	
	Major Street	Minor Street
1400	438	26
1500	377	25
1600	439	23
1700	559	38



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/7/08  
Major Street: Cross St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Commercial St Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	559	38

#### Criteria

##### 1. Delay on Minor Approach \*(vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

##### 2. Volume on Minor Approach \*(vehicles per hour)

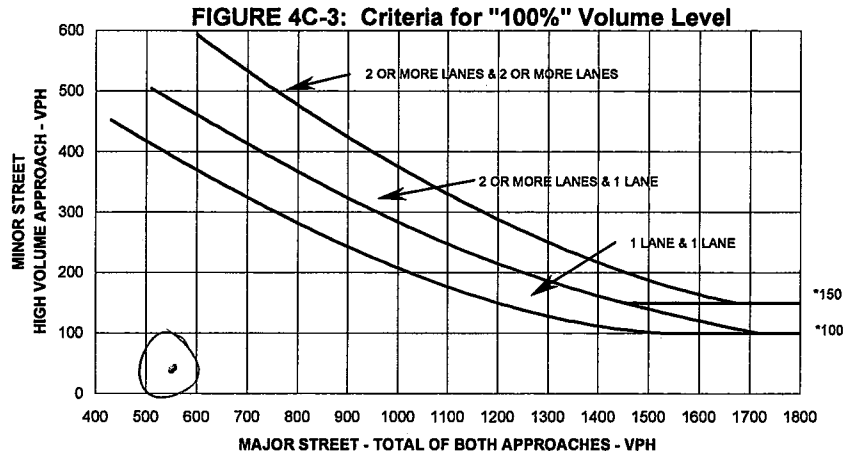
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	38	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

##### 3. Total Entering Volume \*(vehicles per hour)

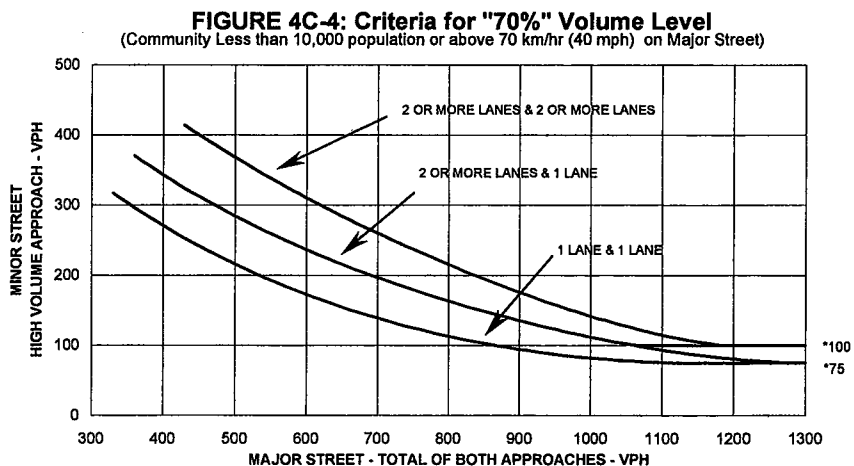
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	597	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/7/09  
Major Street: Cross St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Commercial St Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8:00	207			
	9:00	151			
	16:00	146			
	17:00	207			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		207			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/7/08  
Major Street: Purchase St / SASB Lanes: 3 Critical Approach Speed: 30  
Minor Street: Clinton / 1-93 ramps Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1400	1700
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	736	1089	808	655	665	614	649	581
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	830	1082	870	616	465	377	342	413

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☒ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1400	1700
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	736	1089	808	655	665	614	649	581
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	830	1082	870	616	465	377	342	413

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sin  
Date: 11/7/00  
Major Street: Purchase / SASB  
Minor Street: Clinton / Ramps  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 36

## Volume Level Criteria

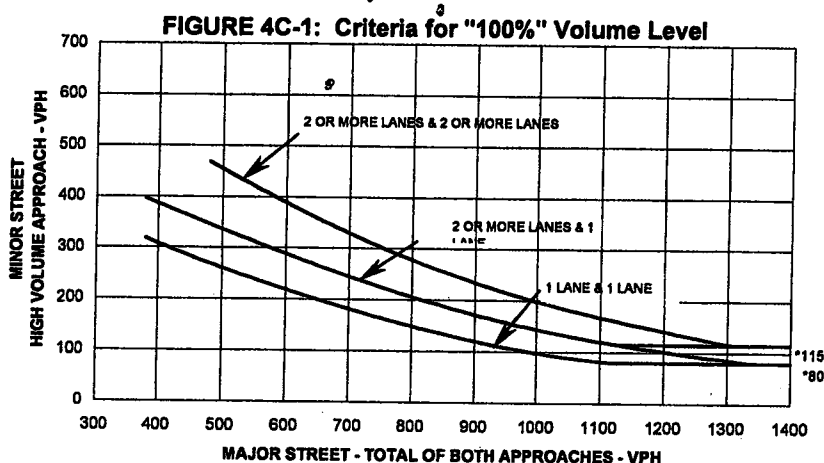
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

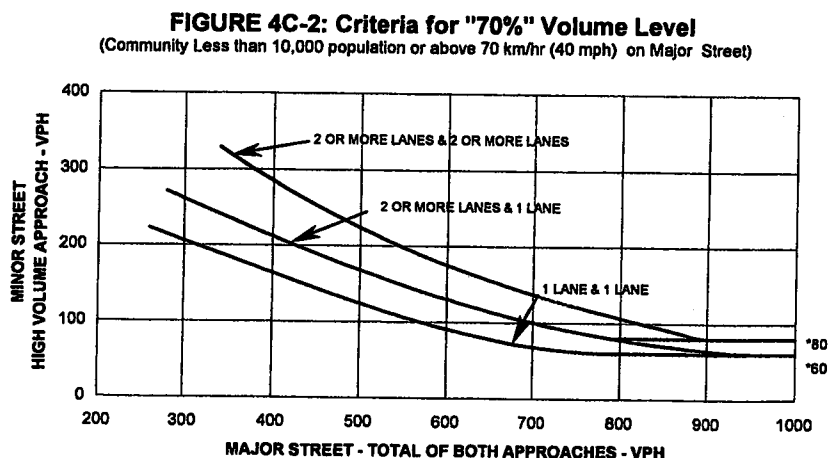
Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	736	830
800	1089	1082
900	808	870
1000	655	616



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SARB  
Minor Street: Clinton / Ramps

Engineer: A. Siu  
Date: 11/7/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
800	1009	1002

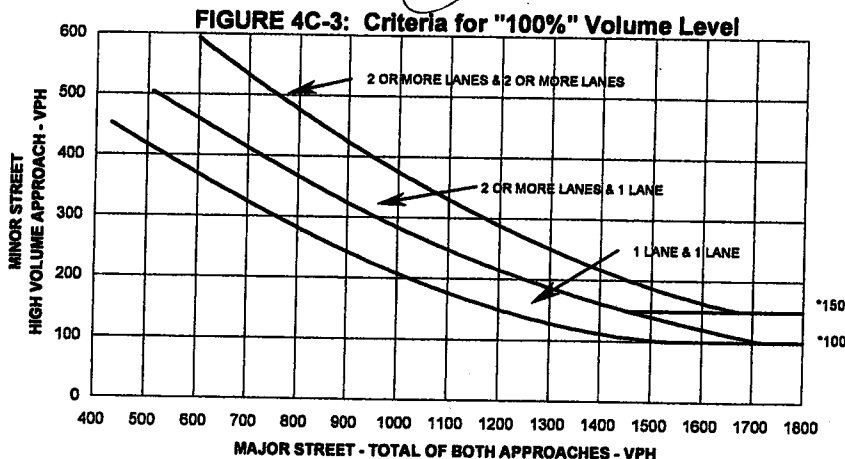
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

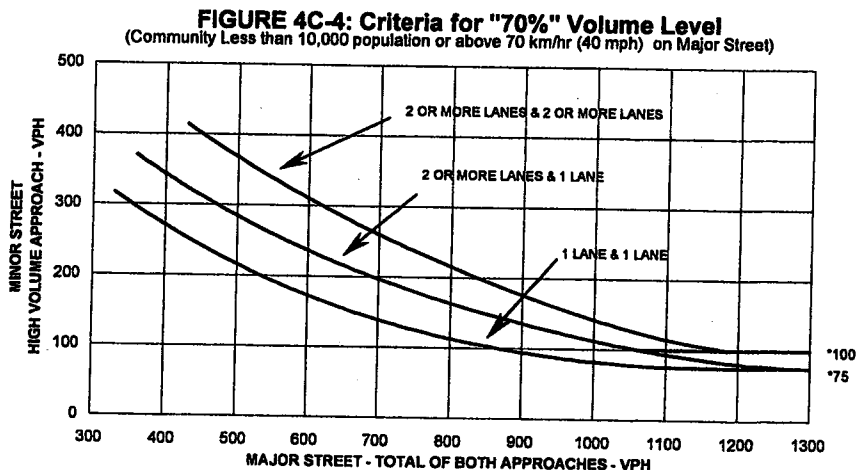
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		1002
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	2171	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SASH  
Minor Street: Clinton / Ramps

Engineer: A. Sim  
Date: 11/7/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8:00	165			
	13:00	159			
	16:00	168			
	17:00	220			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		220			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/19/08  
Major Street: Kneeland St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Surface St. Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1339	1306	1197	1207	1223	1330	1354	1450
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	785	967	910	913	932	1118	1185	1260

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1339	1306	1197	1207	1223	1330	1354	1450
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	785	967	910	913	932	1118	1185	1260

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Kneeland St.  
Minor Street: Surface St.

Engineer: A. Sin  
Date: 11/19/08  
Lanes: 2  
Lanes: 2 Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

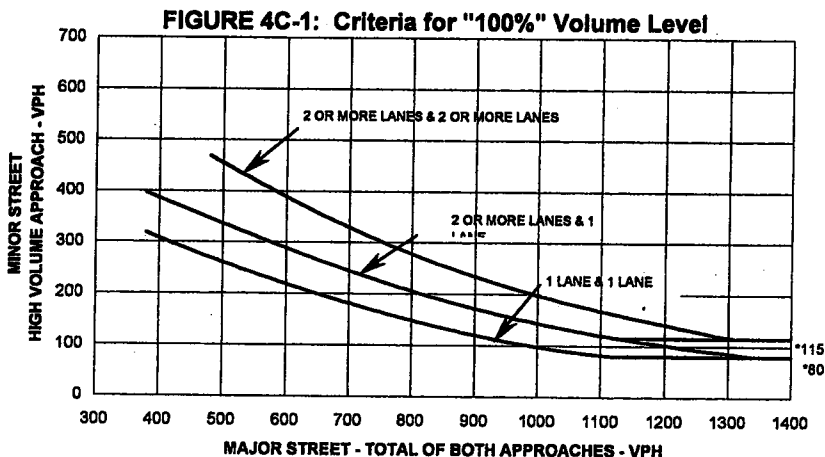
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

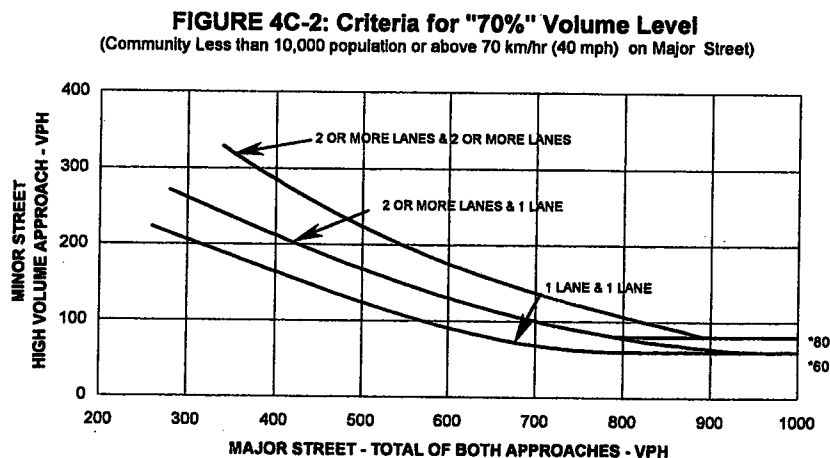
Plot four volume combinations on the applicable figure below.

\* All points above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
10 <sup>00</sup>	1306	967
15 <sup>00</sup>	1330	1118
16 <sup>00</sup>	1354	1185
17 <sup>00</sup>	1450	1260



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/19/08  
Major Street: Kneeland St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Surface St. Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	1450	1260

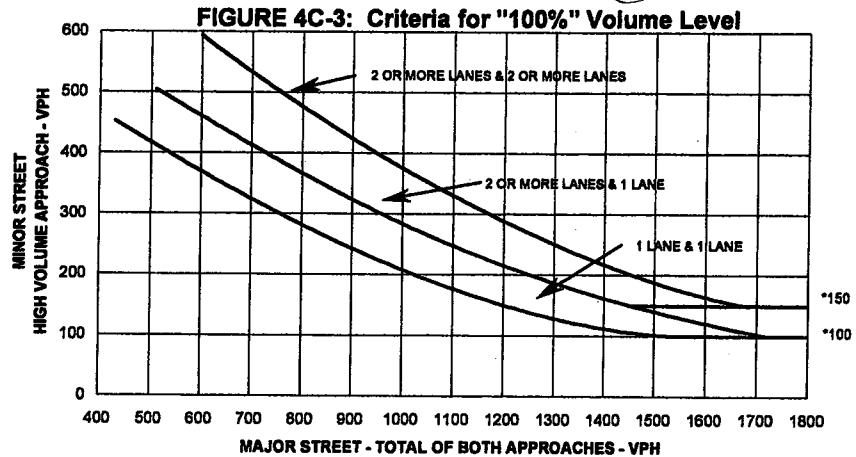
#### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

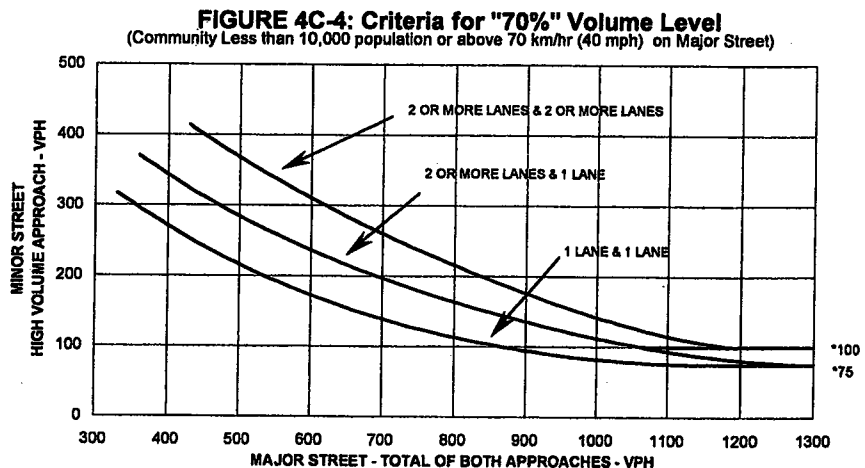
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sil  
County: Suffolk Date: 11/19/08  
Major Street: Kneeland St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Surface A. Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7 <sup>00</sup>	78			X
	8 <sup>00</sup>	38			
	14 <sup>00</sup>	17			
	16 <sup>00</sup>	22			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes:  $\frac{2}{2}$  Critical Approach Speed: 30

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sil  
County: Suffolk Date: 11/21/08  
Major Street: SASB Lanes: 3 Critical Approach Speed: 30  
Minor Street: Beach St. Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1		2 or more									
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	856	786	798	856	928	1070	1213	1298
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	117	98	120	88	79	83	75	88

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	850	786	798	850	928	1070	1213	1298
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	117	98	120	88	79	83	75	88

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 11/21/08

Major Street: SASB  
Minor Street: Beach St.

Lanes: 3 Critical Approach Speed: 30  
Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

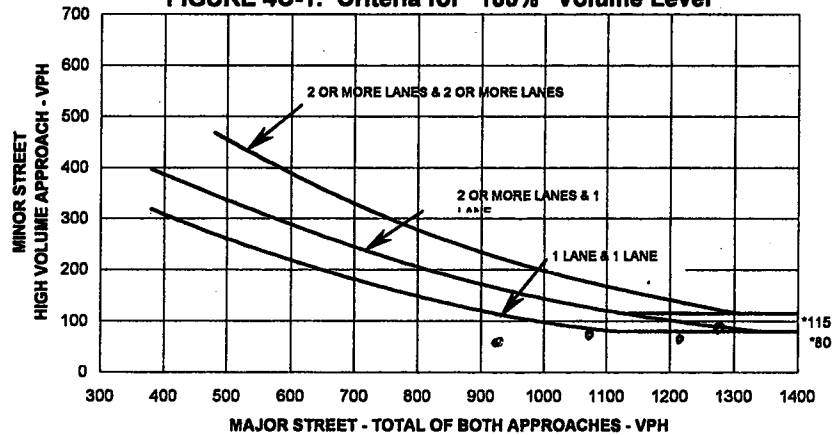
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

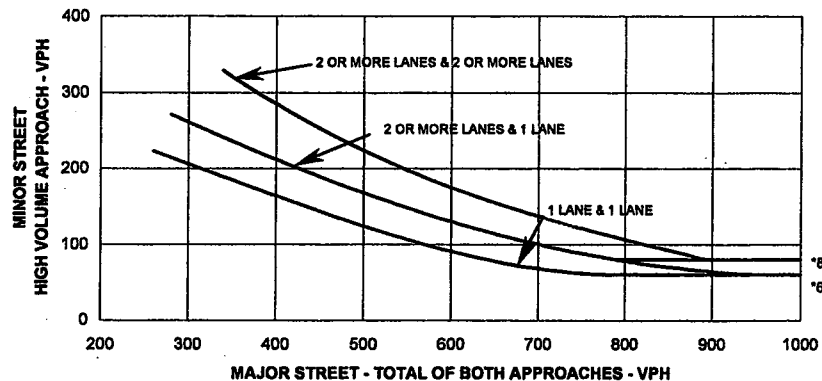
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
1400	928	79
1500	1070	83
1600	1213	75
1700	1298	88

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/20/08

Major Street: SASB  
Minor Street: Beach St.

Lanes: 3 Critical Approach Speed: 30  
Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
1700	1298	88

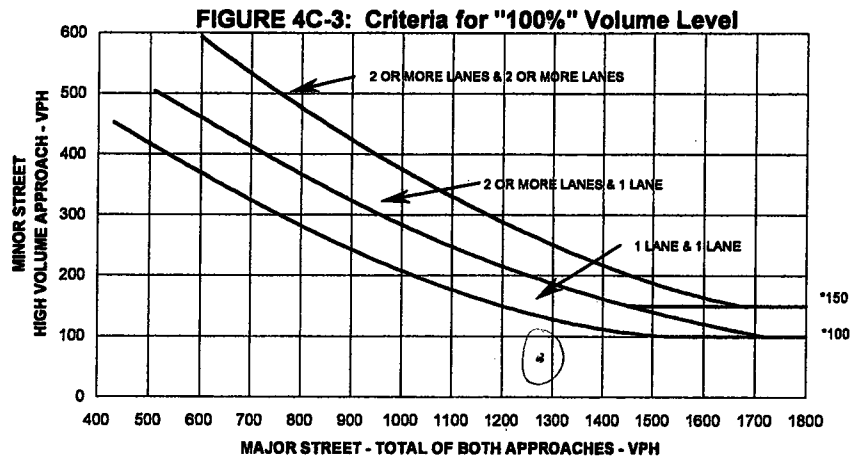
#### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

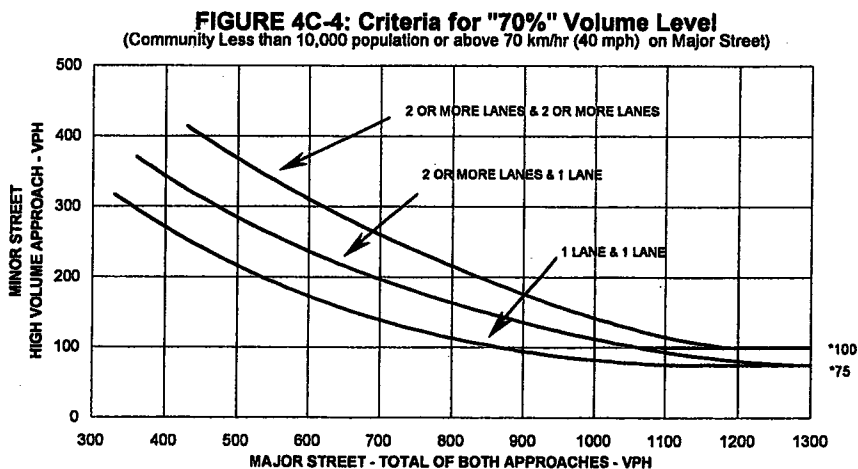
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	88	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1386	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sil  
Date: 11/27/08

Major Street: SASB  
Minor Street: Beach St.

Lanes: 3  
Lanes: 1  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	9 <sup>00</sup>	753			
	10 <sup>00</sup>	829			
	11 <sup>00</sup>	700			
	12 <sup>00</sup>	969			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silu  
Date: 11/21/08

Major Street: SAB B  
Minor Street: 1-93, ESSEX

Lanes: 3 Critical Approach Speed: 30  
Lanes: 3

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420	714	714	794	870	934	873	1013	1104
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	714	648	629	640	692	714	619	732

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630	714	714	794	870	934	873	1013	1104
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	714	648	629	640	692	714	619	732

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 11/21/08

Major Street: SASB  
Minor Street: 1-93, Essex

Lanes: 3  
Lanes: 3  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

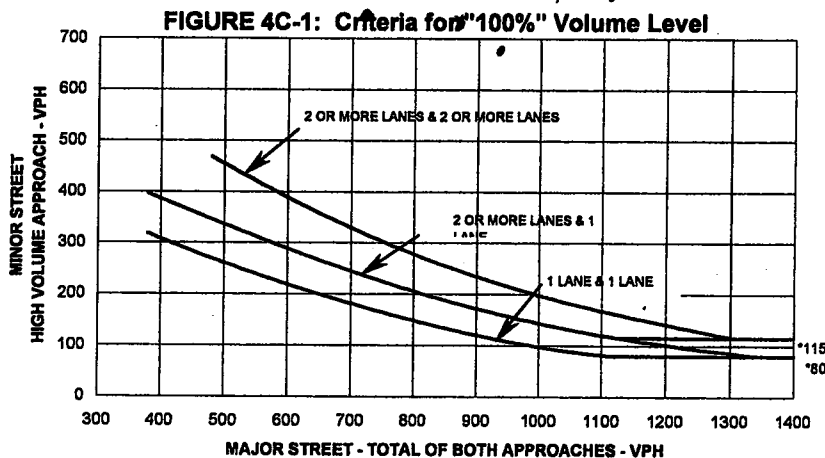
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

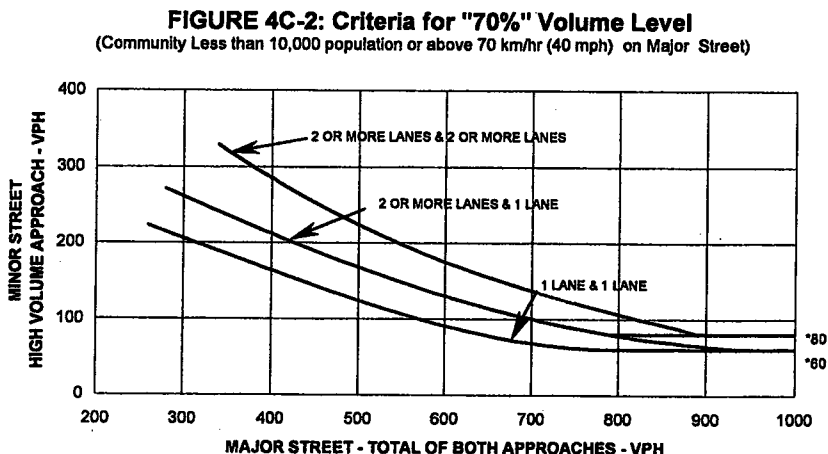
Plot four volume combinations on the applicable figure below.

\* All points above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	714	714
1400	934	692
1500	873	714
1700	1104	732



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: SASB  
Minor Street: I-93, Essex

Engineer: A. Siu  
Date: 11/21/08  
Lanes: 3  
Lanes: 3  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	1169	732

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

#### 2. Volume on Minor Approach (vehicles per hour)

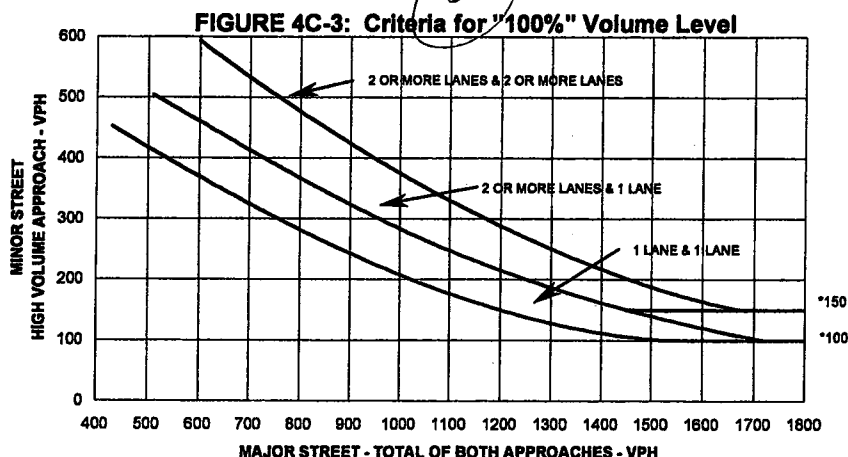
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		732
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

#### 3. Total Entering Volume (vehicles per hour)

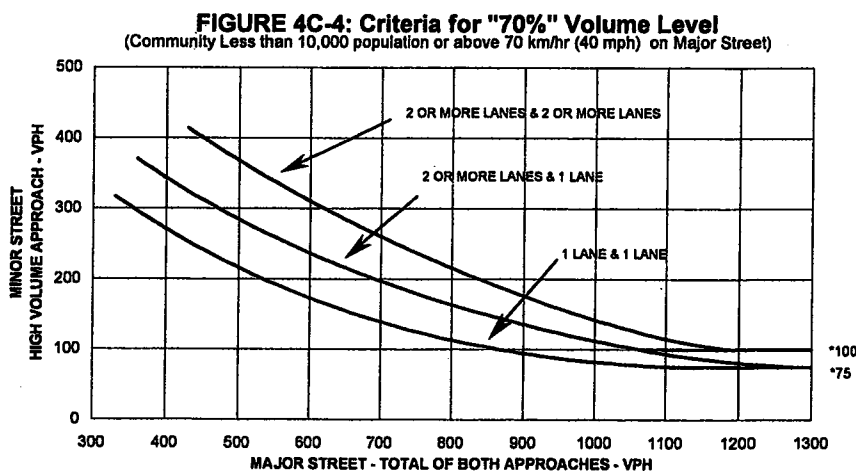
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1169	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sullivan  
County: Suffolk Date: 11/21/08  
Major Street: SPSB Lanes: 3 Critical Approach Speed: 30  
Minor Street: 1-93, Essex Lanes: 3

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	<u>7:00</u>	<u>445</u>			
	<u>8:00</u>	<u>612</u>			
	<u>12:00</u>	<u>458</u>			
	<u>1:00</u>	<u>403</u>			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				<input checked="" type="checkbox"/>	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
 County: Suffolk Date: 11/21/08  
 Major Street: SAB Lanes: 3 Critical Approach Speed: 30  
 Minor Street: 1-93, Essex Lanes: 3

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☐ Yes ☐ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)					
	Warrant 1, Condition B (80% satisfied)					
	Warrant 4, Pedestrian Volume at 80% of volume requirements: 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour					
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months: <u>5</u>					

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☒ Yes ☐ No

Criteria	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: <u>2259</u>		
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant: <u>1</u> <u>2</u> <u>3</u> Satisfied?: <u>Y</u> <u>Y</u> <u>Y</u>		
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	<u>NO</u>	<u>DATA</u>	← Hour	
			← Volume	

Characteristics of Major Routes	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:	<input checked="" type="checkbox"/>		
	Minor Street:	<input checked="" type="checkbox"/>		
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:	<input checked="" type="checkbox"/>		
	Minor Street:	<input checked="" type="checkbox"/>		
3. Appears as a major route on an official plan.	Major Street:	<input checked="" type="checkbox"/>		
	Minor Street:	<input checked="" type="checkbox"/>		

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Silva  
County: Suffolk Date: 11/19/08  
Major Street: Essex St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: South St. Lanes:     

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420								
Highest Approach on Minor Street	150 (120)	105	200 (160)	140								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☐ Yes ☒ No  
Excessive Delay: ☐ Yes ☒ No  
100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630								
Highest Approach on Minor Street	75 (60)	53	100 (80)	70								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☒

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☒

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A.S. W  
Date: 11/19/08

Major Street: Essex St.  
Minor Street: South St.

Lanes: 2 Critical Approach Speed: 30  
Lanes:       

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

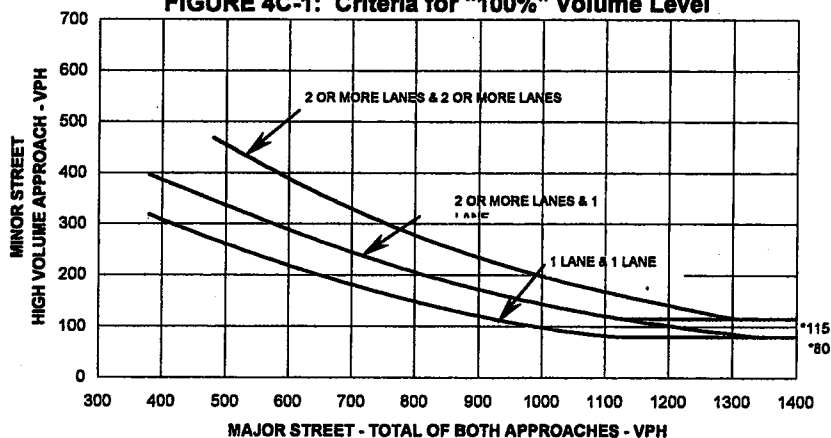
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

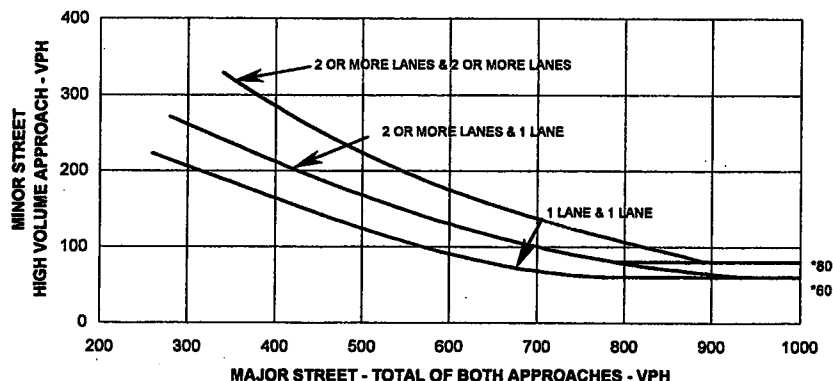
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A.Siu  
Date: 11/19/08

Major Street: Essex St.  
Minor Street: South St

Lanes: 2 Critical Approach Speed: 30  
Lanes:       

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		

#### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes <input type="checkbox"/> No	

#### 2. Volume on Minor Approach (vehicles per hour)

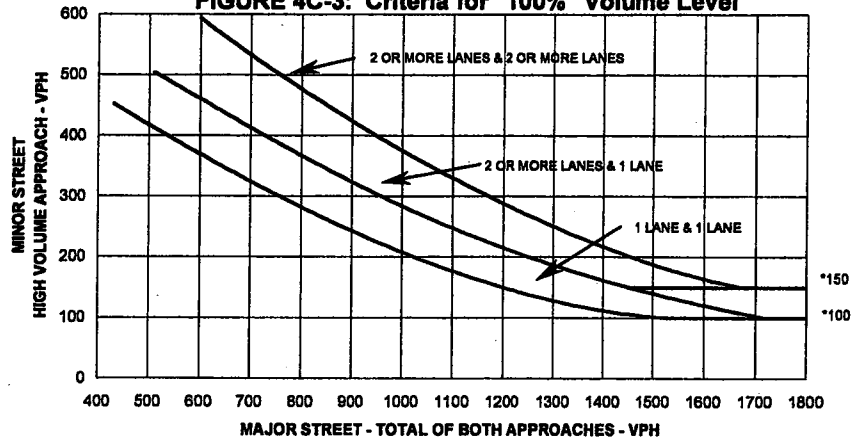
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes <input type="checkbox"/> No	

#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes <input type="checkbox"/> No	

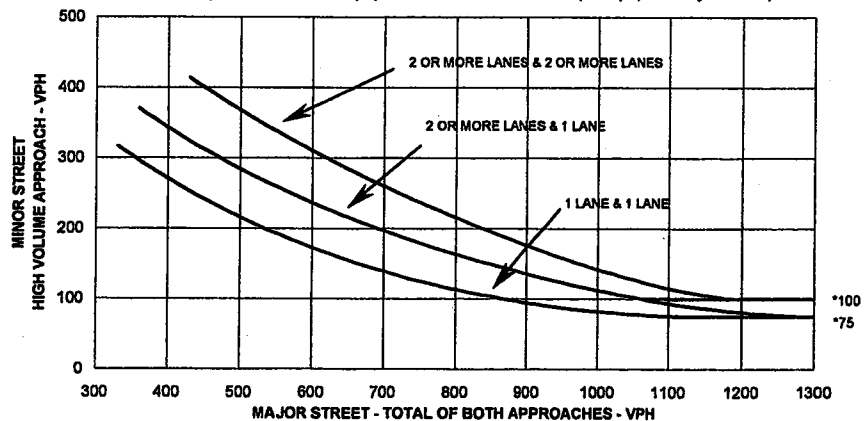
Plot volume combination on the applicable figure below.

FIGURE 4C-3: Criteria for "100%" Volume Level



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-4: Criteria for "70%" Volume Level  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sullivan  
Date: 11/19/08

Major Street: Essex St.  
Minor Street: South St.

Lanes: 2 Critical Approach Speed: 30  
Lanes:         

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	367			
	12 <sup>00</sup>	796			
	16 <sup>00</sup>	344			
	17 <sup>00</sup>	398			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:		Gaps:		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		





TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sim  
Date: 11/17/08

Major Street: Purchase St  
Minor Street: Summer St.

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1300	1400	1600	1700
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420	947	1007	1066	1026	878	843	918	1002
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	619	767	637	529	497	526	479	624

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1300	1400	1600	1700
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630	947	1007	1066	1026	878	843	918	1002
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	619	767	637	529	497	526	479	624

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sin  
Date: 11/17/08

Major Street: Purchase St.  
Minor Street: Summer St.

Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

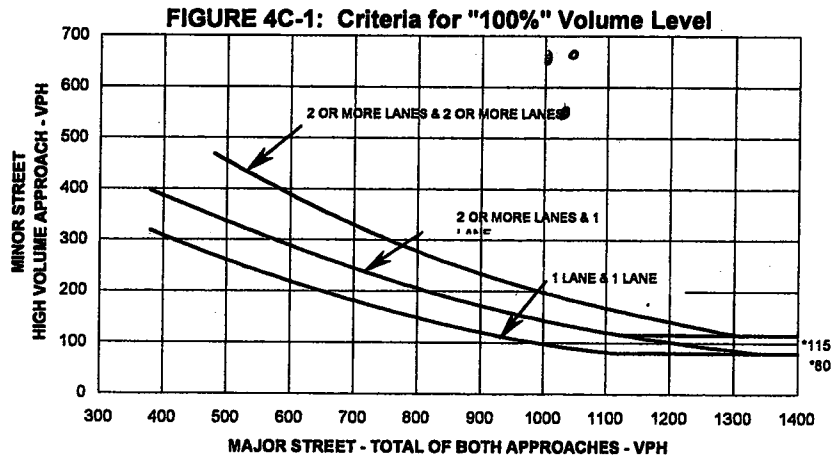
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

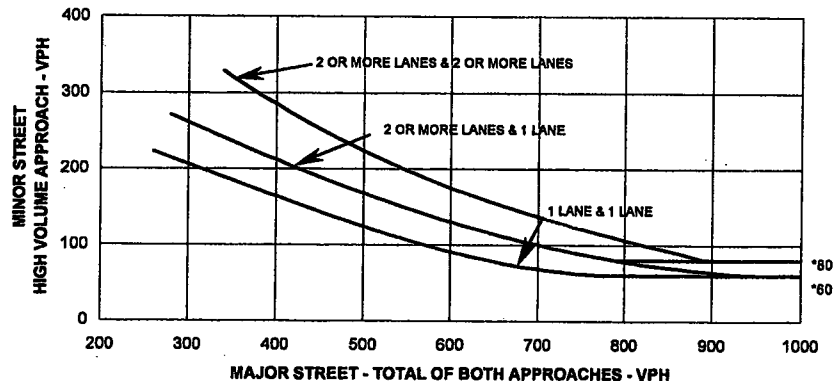
\* All points above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1067	767
900	1066	637
1000	1026	529
1700	1002	624



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

**FIGURE 4C-2: Criteria for "70%" Volume Level**  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/17/08  
Major Street: Purchase St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: Summer St. Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
800	1007	767

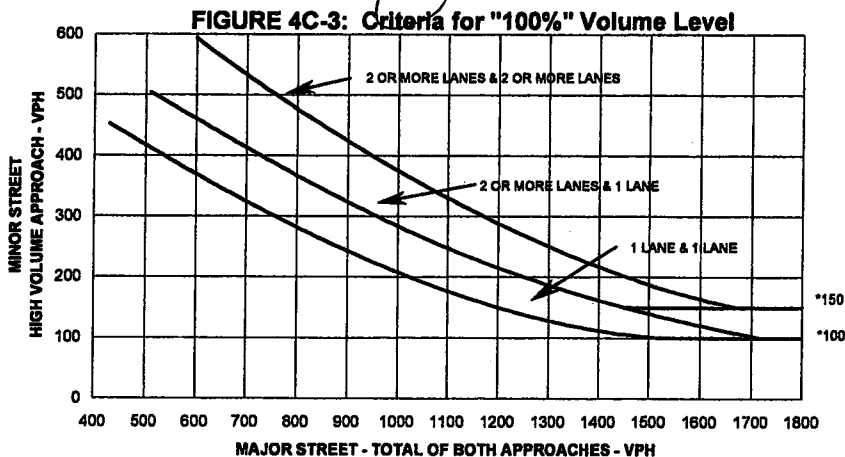
#### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

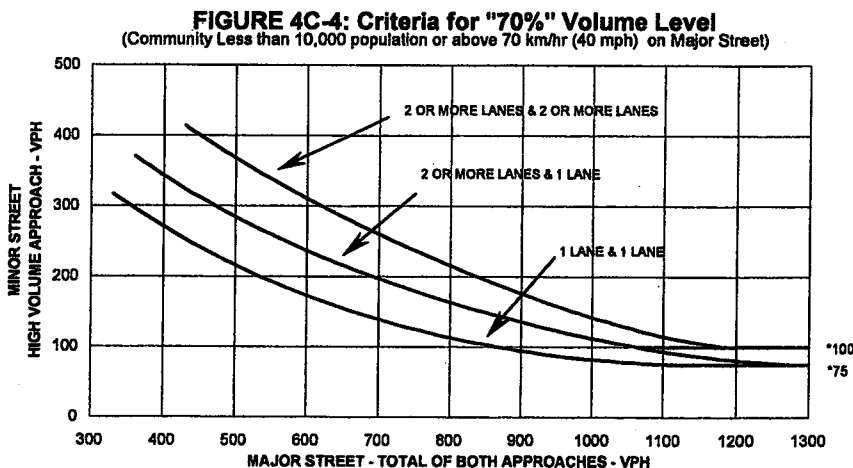
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		767
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1976	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sil  
Date: 11/17/08  
Major Street: Purchase St  
Minor Street: Summer St  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	500	1548			
	800	2213			
	1600	1896			
	1700	2073			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				<input checked="" type="checkbox"/>	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/17/08  
Major Street: Purchase St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: Summer St. Lanes: 2

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)		<input checked="" type="checkbox"/>			
	Warrant 1, Condition B (80% satisfied)		<input checked="" type="checkbox"/>			
	Warrant 4, Pedestrian Volume at 80% of volume requirements: 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months:			<u>1</u>		<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume: <u>1876</u>	<input checked="" type="checkbox"/>
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant: <u>1</u> <u>2</u> <u>3</u>	<input checked="" type="checkbox"/>
	Satisfied?: <u>Y</u> <u>Y</u> <u>Y</u>			
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	<u>NO DATA</u>		← Hour	
			← Volume	

Characteristics of Major Routes	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	Minor Street:	<input checked="" type="checkbox"/>		
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:	<input checked="" type="checkbox"/>		
	Minor Street:	<input checked="" type="checkbox"/>		
3. Appears as a major route on an official plan.	Major Street:	<input checked="" type="checkbox"/>		
	Minor Street:	<input checked="" type="checkbox"/>		

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
 County: Suffolk Date: 11/17/08  
 Major Street: Purchase St. Lanes: 3 Critical Approach Speed: 30  
 Minor Street: Congress St. Lanes: 4

**Volume Level Criteria**

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
 2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
 If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

**WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME**

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
 Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☒ Yes ☐ No

**Condition A - Minimum Vehicular Volume**

100% Satisfied: ☒ Yes ☐ No  
 80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1024	826	909	957	990	1063	1199	1397
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	640	684	672	717	761	972	1126	1381

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

**Condition B - Interruption of Continuous Traffic**

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
 Excessive Delay: ☐ Yes ☐ No  
 100% Satisfied: ☒ Yes ☐ No  
 80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1024	826	909	957	990	1063	1199	1397
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	640	684	672	717	761	972	1126	1381

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

**WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME**

Delay is not excessive.

Not Applicable: ☐

**WARRANT 3 - PEAK HOUR**

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. SIM  
County: Suffolk Date: 11/17/08  
Major Street: Purchase St Lanes: 3 Critical Approach Speed: 30  
Minor Street: Congress St Lanes: 4

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

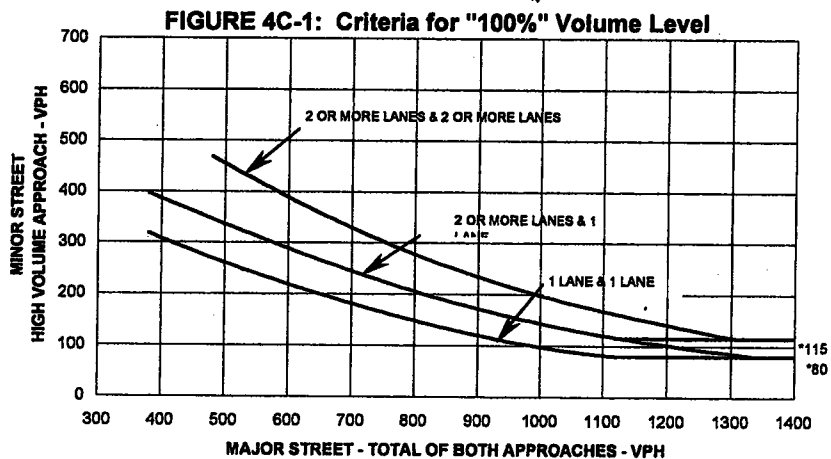
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

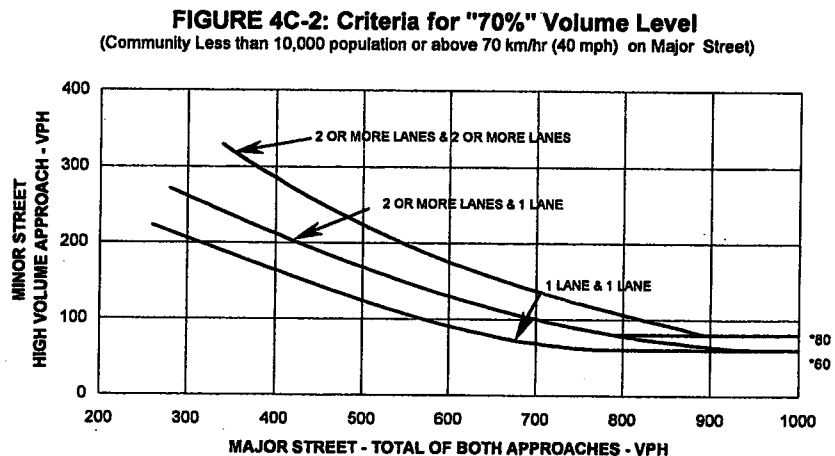
Plot four volume combinations on the applicable figure below.

*\* All points above line*

Four Highest Hours	Volumes	
	Major Street	Minor Street
1400	990	761
1500	1063	972
1600	1199	1126
1700	1397	1381



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/17/08

Major Street: Purchase St.  
Minor Street: Congress St

Lanes: 3  
Lanes: 4

Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	1397	1301

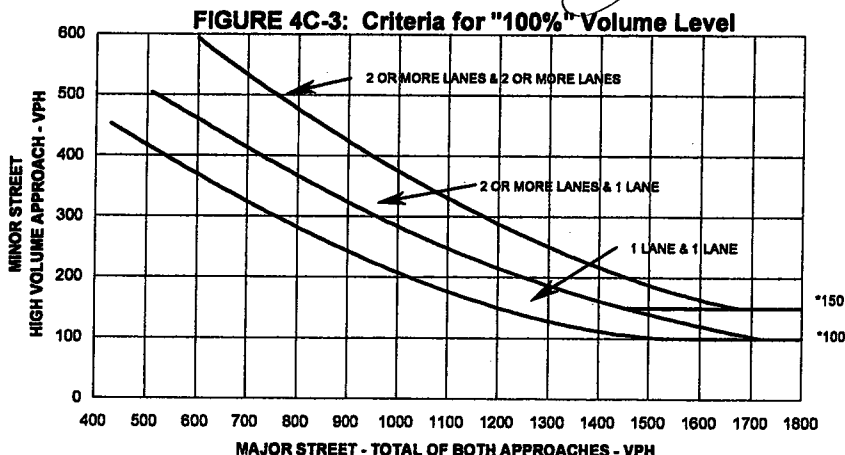
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

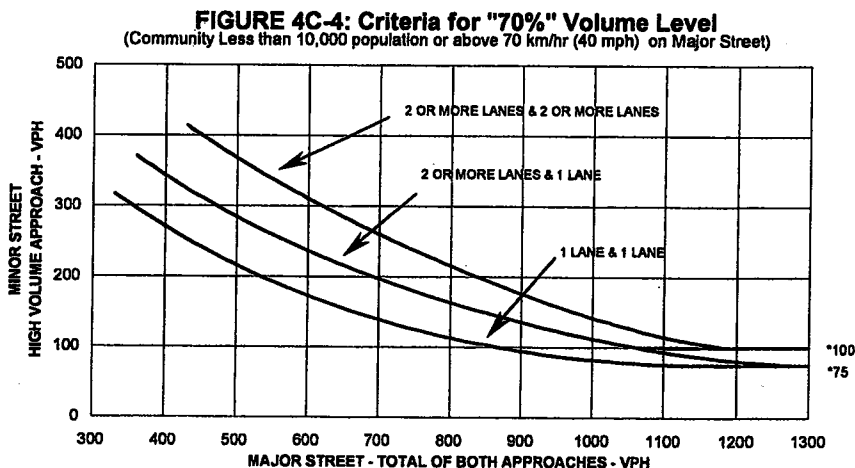
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		1301
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	2778	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/17/08  
Major Street: Purchase St.  
Minor Street: Congress St.  
Lanes: 3  
Lanes: 4  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7:00	237			
	8:00	446			
	9:00	254			
	1:00	317			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3 Critical Approach Speed: 30  
Lanes: 4

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Silva  
 County: Suffolk Date: 11/19/08  
 Major Street: Kneeland St. Lanes: 2 Critical Approach Speed: 30  
 Minor Street: Lincoln St Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
 2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
 If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
 Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
 80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	912	1174	1137	973	1021	1015	1005	1081
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	894	1005	823	716	535	554	410	466

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
 Excessive Delay: ☐ Yes ☐ No  
 100% Satisfied: ☒ Yes ☐ No  
 80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	912	1174	1137	973	1021	1015	1005	1081
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	894	1005	823	716	535	554	410	466

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Silva  
Date: 11/19/08  
Major Street: Kneeland St  
Minor Street: Lincoln St  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

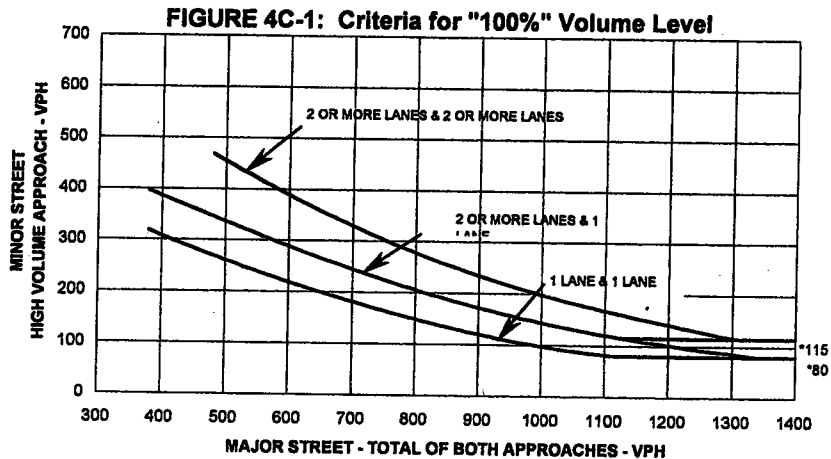
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

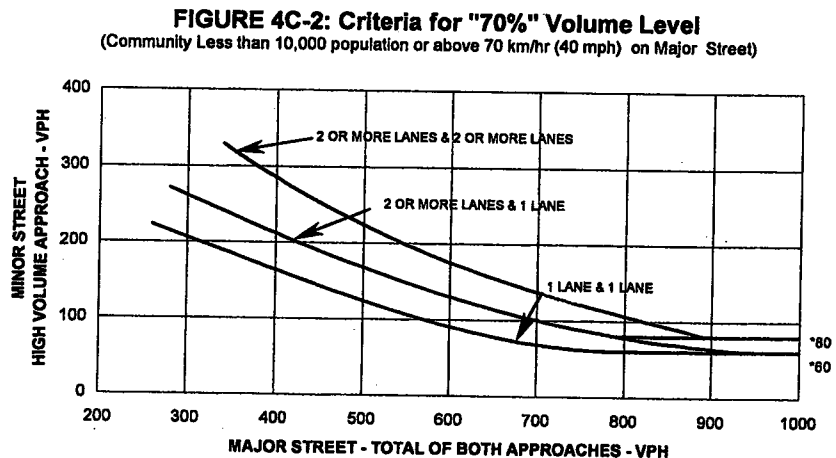
Plot four volume combinations on the applicable figure below.

★ All points above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	912	894
800	1174	1005
900	1137	823
1000	973	716



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Kneeland St.  
Minor Street: Lincoln St.

Engineer: A.Siu  
Date: 11/19/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
800	1174	1005

#### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

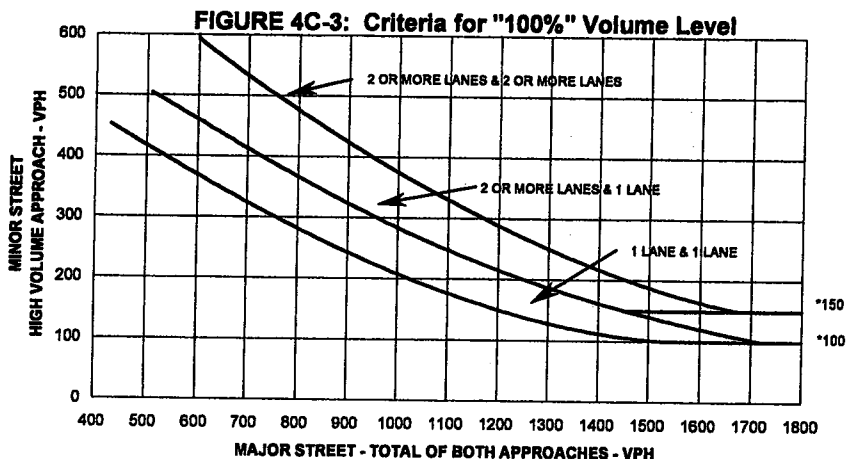
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		1005
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

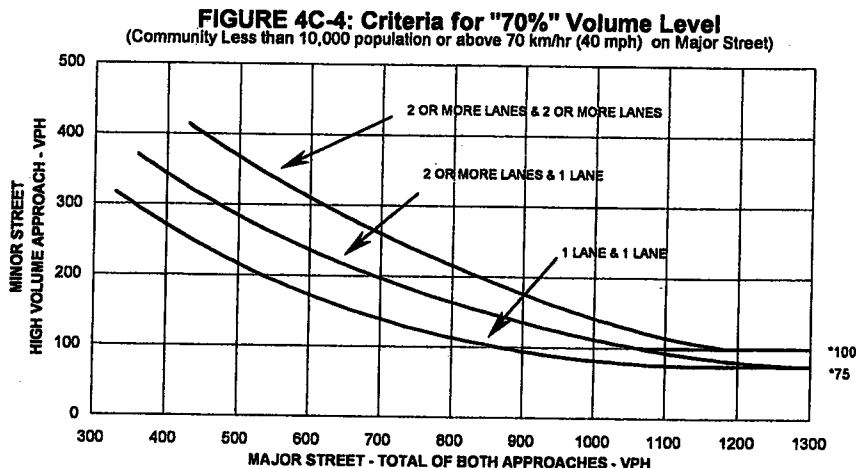
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	2179	
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/19/88  
Major Street: Kneeland St.  
Minor Street: Lincoln St.  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	9			
	14 <sup>00</sup>	8			
	15 <sup>00</sup>	9			
	16 <sup>00</sup>	14			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sin  
Date: 11/11/08  
Major Street: I-93 Ramp  
Minor Street: Purchase / SPSB  
Lanes: 2  
Lanes: 3  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1400	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1006	1132	992	838	654	516	484	454
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	307	410	437	323	373	324	380	414

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1400	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1006	1132	992	838	654	516	484	454
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	307	410	437	323	373	324	380	414

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sin  
Date: 11/11/08  
Major Street: I-93  
Minor Street: Purchase / SARB  
Lanes: 2  
Lanes: 3  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

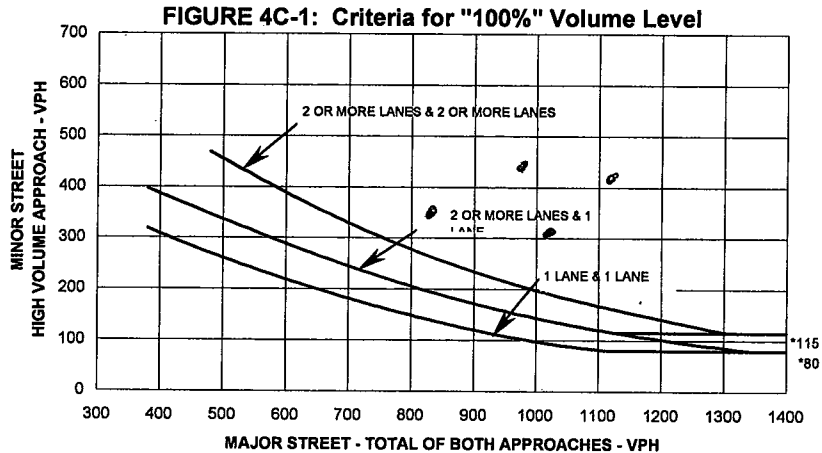
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

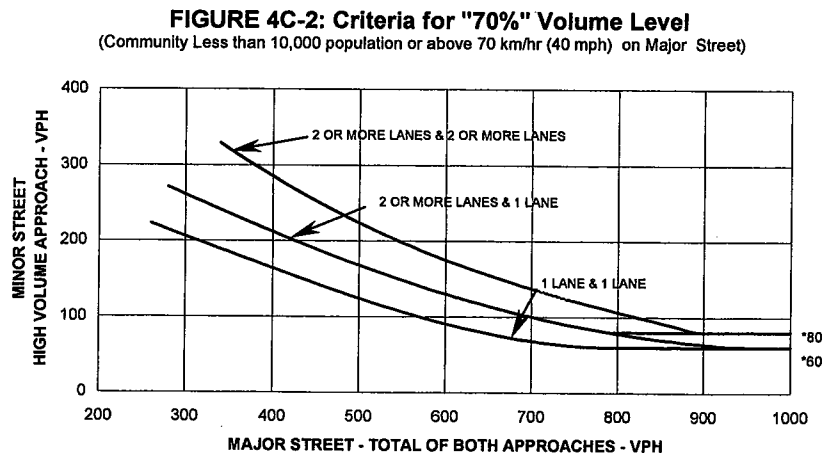
Plot four volume combinations on the applicable figure below.

\* All points above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1006	307
800	1132	410
900	992	437
1000	838	323



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Silva  
Date: 11/11/08  
Major Street: I-93  
Minor Street: Purchase / SARB  
Lanes: 2  
Lanes: 3  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
800	1132	410

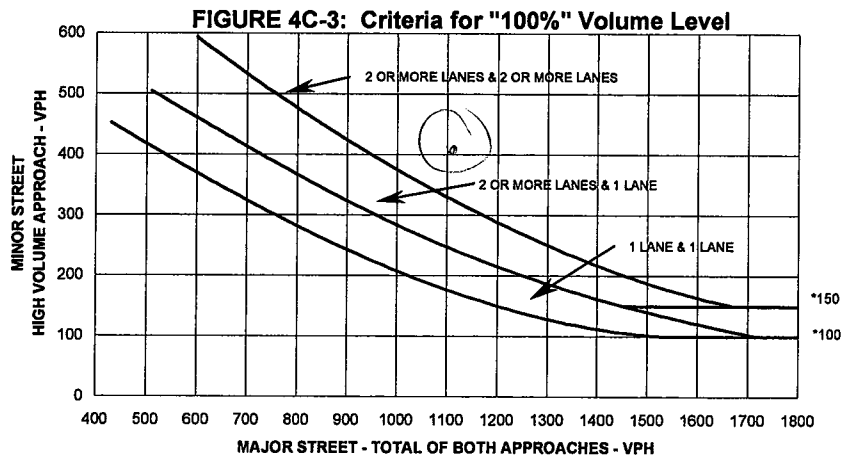
#### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

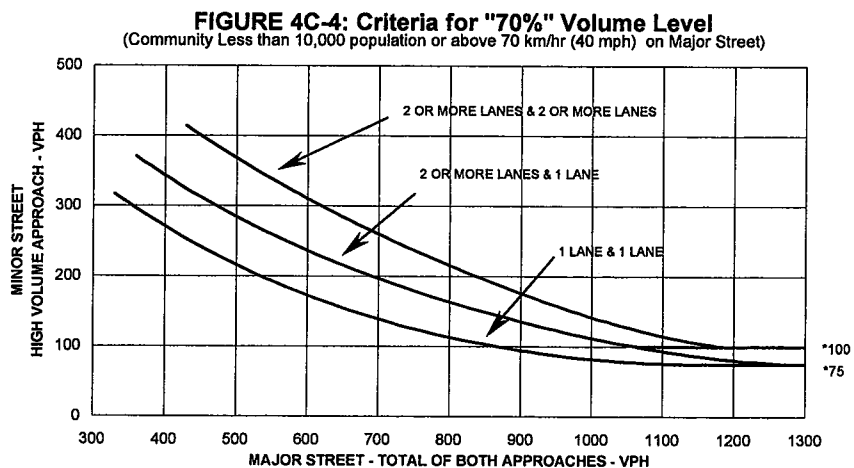
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		410
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1586	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Su  
Date: 11/11/08

Major Street: 1-93  
Minor Street: Purchase / SABB

Lanes: 2 Critical Approach Speed: 30  
Lanes: 3

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	1200	150			
	1400	274			
	1600	209			
	1700	292			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 3

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/11/08  
Major Street: I-93 ramps Lanes: 2 Critical Approach Speed: 30  
Minor Street: CROSS ST. Lanes: 3

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1300	1400
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	347	407	404	400	526	425	575	790
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	459	587	596	438	412	425	519	543

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1300	1400
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	347	407	404	400	526	425	575	790
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	459	587	596	438	412	425	519	543

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 11/11/08

Major Street: I-93 ramps  
Minor Street: Cross

Lanes: 2 Critical Approach Speed: 30  
Lanes: 3

## Volume Level Criteria

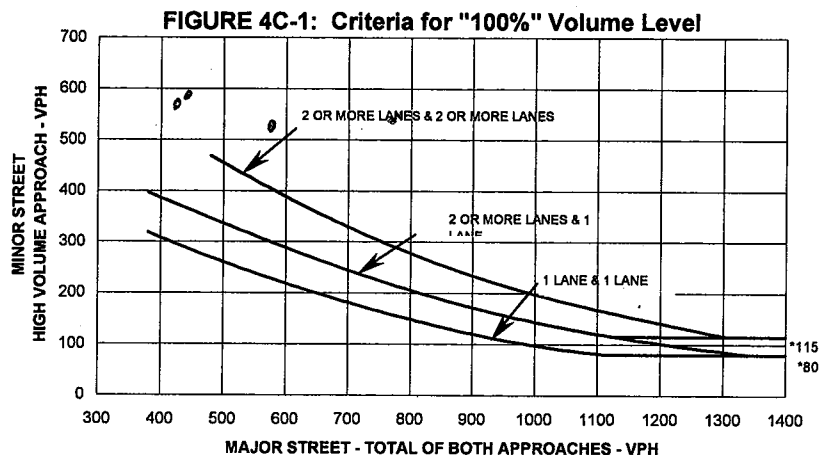
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

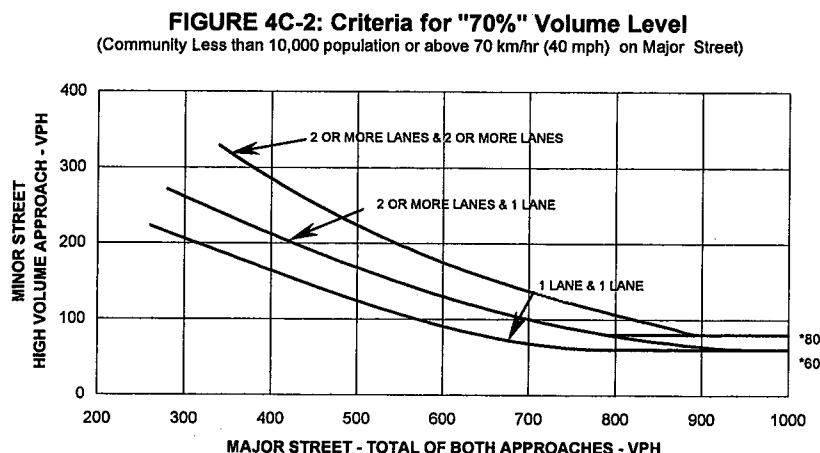
Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	407	587
900	404	596
1606	575	519
1700	790	543



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/11/08  
Major Street: I-93 ramps  
Minor Street: Cross  
Lanes: 2  
Lanes: 3  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
<u>1700</u>	<u>790</u>	<u>543</u>

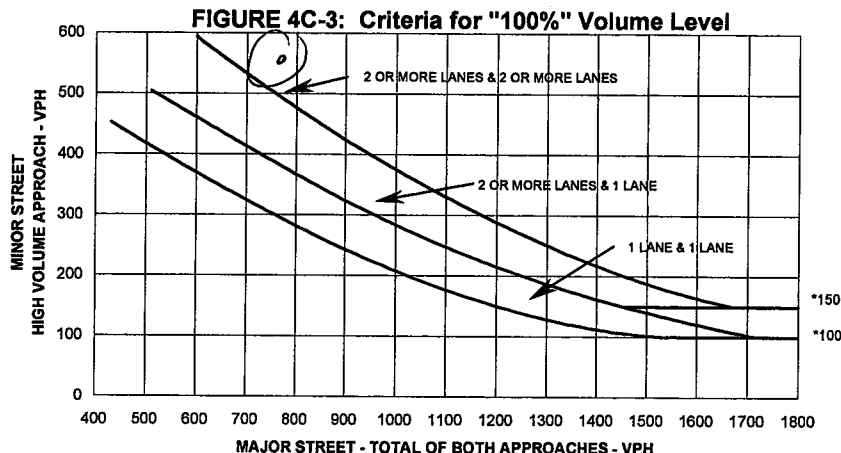
#### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

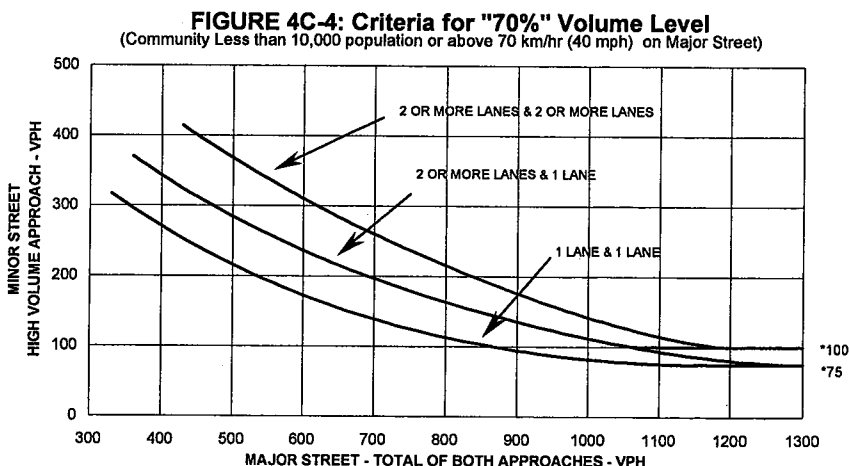
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		<u>543</u>
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	<u>1333</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Su  
Date: 11/11/08

Major Street: I-93 ramps  
Minor Street: Cross St

Lanes: 2 Critical Approach Speed: 30  
Lanes: 3

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	800	169			
	1800	149			
	1600	152			
	1700	189			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 3

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/11/08  
Major Street: Purchase St / SASB Lanes: 2 Critical Approach Speed: 36  
Minor Street: Hanover Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1100	1200	1300	1400	1600	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more		800	900	1100	1200	1300	1400	1600	1700
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	399	436	370	363	348	374	368	412
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	213	202	171	147	163	161	155	172

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1100	1200	1300	1400	1600	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more		800	900	1100	1200	1300	1400	1600	1700
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	399	436	370	363	348	374	368	412
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	213	202	171	147	163	161	155	172

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase / SARB  
Minor Street: Hanover

Engineer: A. Siu  
Date: 11/11/08  
Lanes: 7  
Lanes: 1  
Critical Approach Speed: 36

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

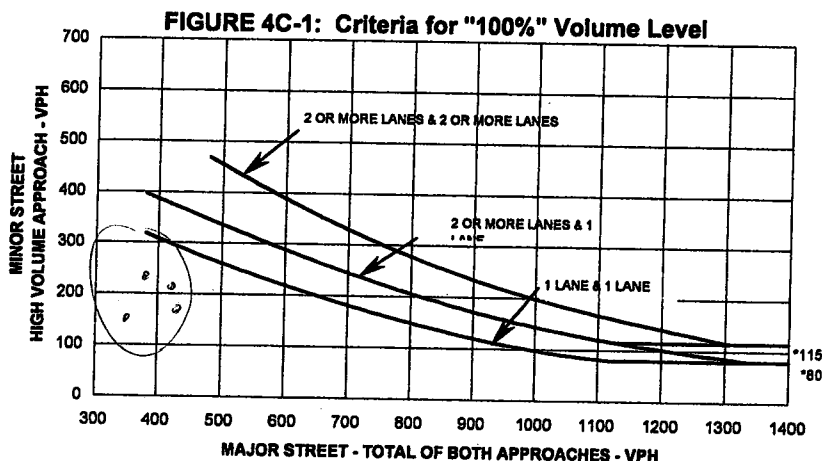
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

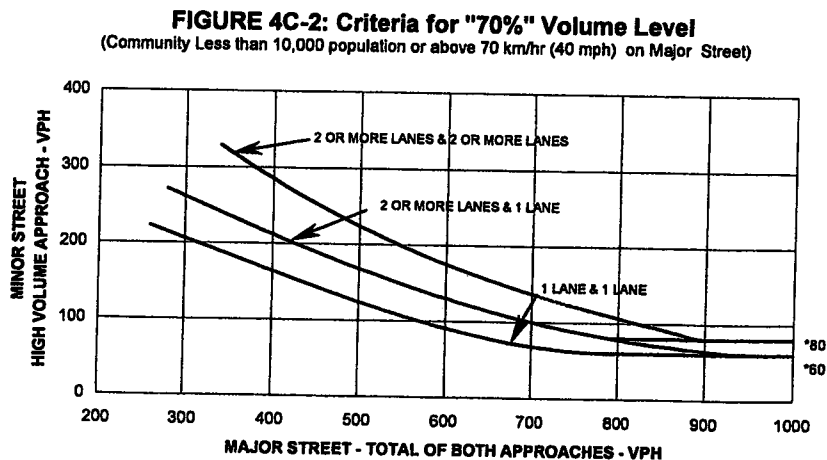
Plot four volume combinations on the applicable figure below.

\* All points below line

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	399	213
900	436	202
1400	374	161
1700	412	172



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Purchase St / SASB  
Minor Street: Harvard

Engineer: A. Siu  
Date: 11/11/19  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
<u>1:00</u>	<u>4:12</u>	<u>1:10</u>

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

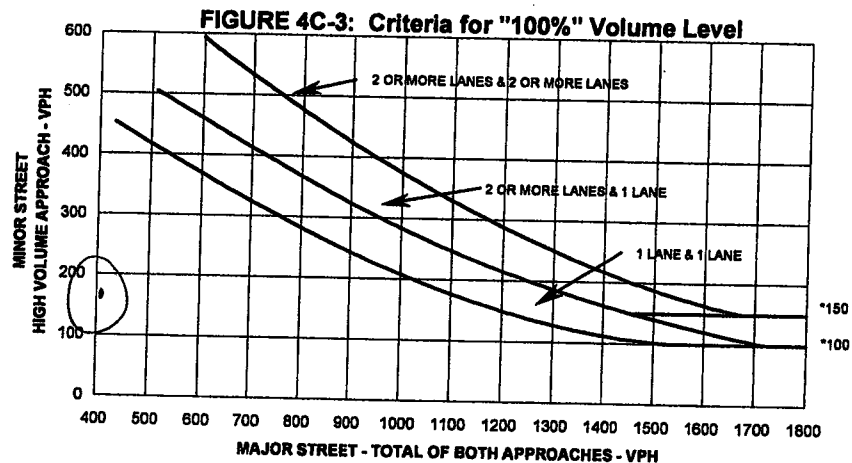
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	<u>172</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

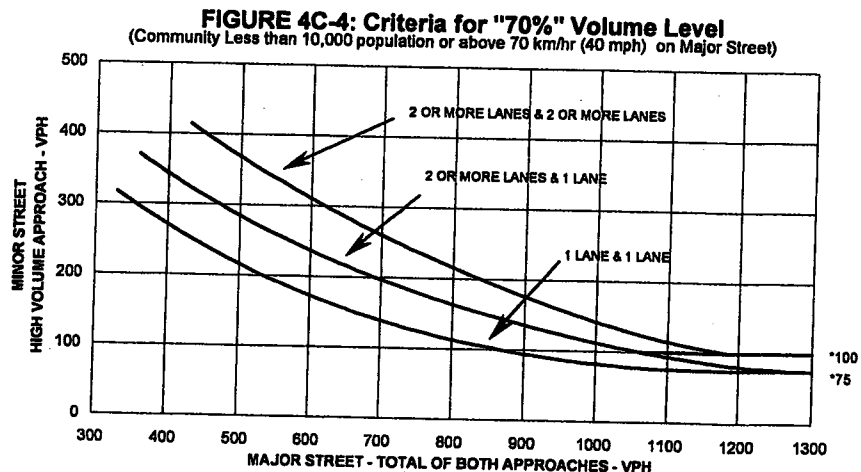
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	<u>661</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sim  
Date: 11/11/08

Major Street: Purchase St / SASSB  
Minor Street: Hanover

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8:00	689			
	1400	551			
	1500	562			
	1700	596			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/12/08  
Major Street: Cross St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Hanover St. Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	870	880	754	701	761	758	921	1201
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	117	107	133	759	159	182	182	206

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	870	880	754	701	761	758	921	1201
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	117	107	133	159	159	182	182	206

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Cross St.  
Minor Street: Hanover St.

Engineer: A. Sin  
Date: 11/12/08  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

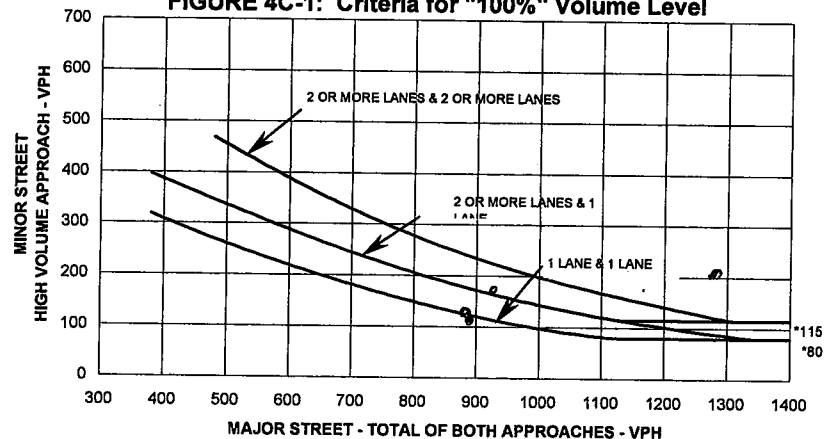
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

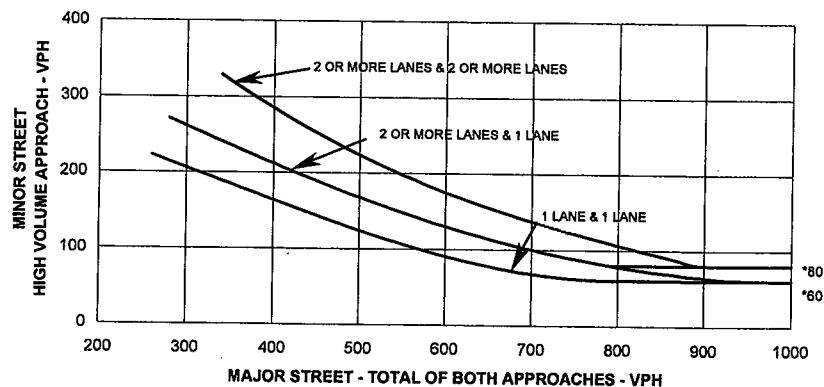
Plot four volume combinations on the applicable figure below.

FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	870	117
900	880	107
1600	921	182
1700	1281	206

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A.SIU  
County: Suffolk Date: 11/12/08  
Major Street: Cross St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Harvard St. Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
<u>70</u>	<u>1231</u>	<u>206</u>

#### Criteria

#### 1. Delay on Minor Approach \*(vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

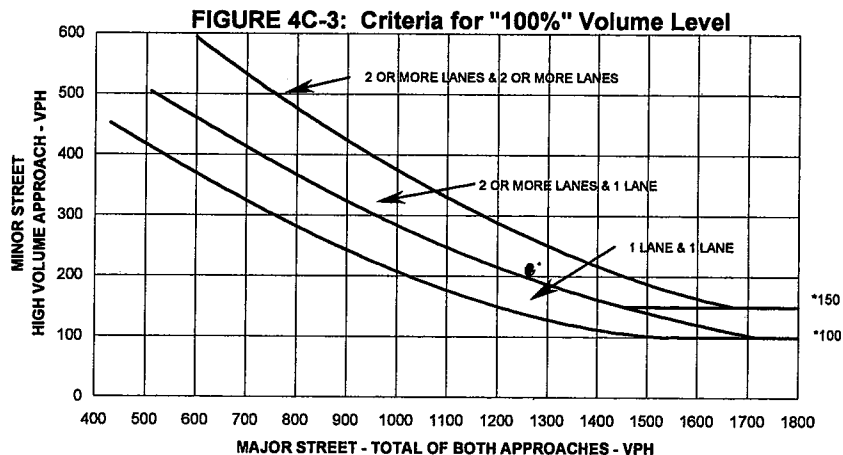
#### 2. Volume on Minor Approach \*(vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	<u>206</u>	<u>2</u>
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

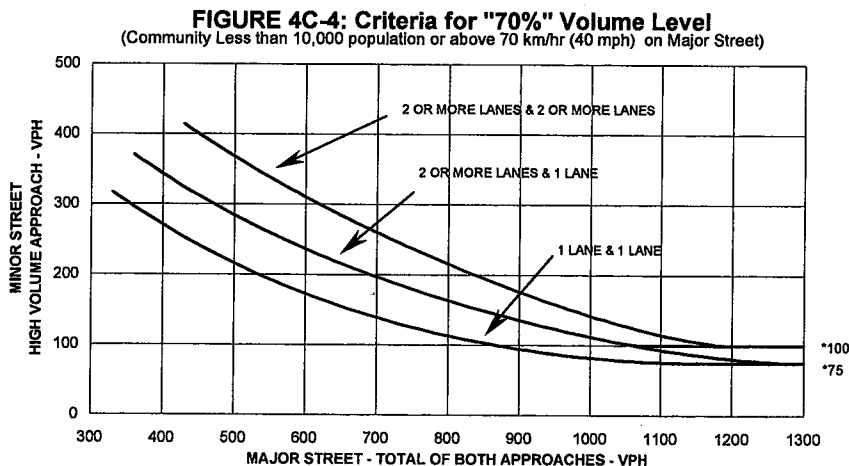
#### 3. Total Entering Volume \*(vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	<u>1576</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sin  
Date: 11/12/08

Major Street: Cross St.  
Minor Street: Harvard St

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	800	203			
	1130	178			
	1700	272			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		272		X	
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Silva  
County: Suffolk Date: 11/12/00  
Major Street: Sudbury St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Surface Rd. Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		900	1100	1200	1300	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	354	488	480	490	585	669	745	908
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	345	219	255	225	257	220	267	330

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☒ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		900	1100	1200	1300	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	354	488	480	490	585	669	745	908
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	345	219	255	225	257	220	267	330

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. S. W.  
Date: 11/12/08

Major Street: Sudbury St  
Minor Street: Surface Rd

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

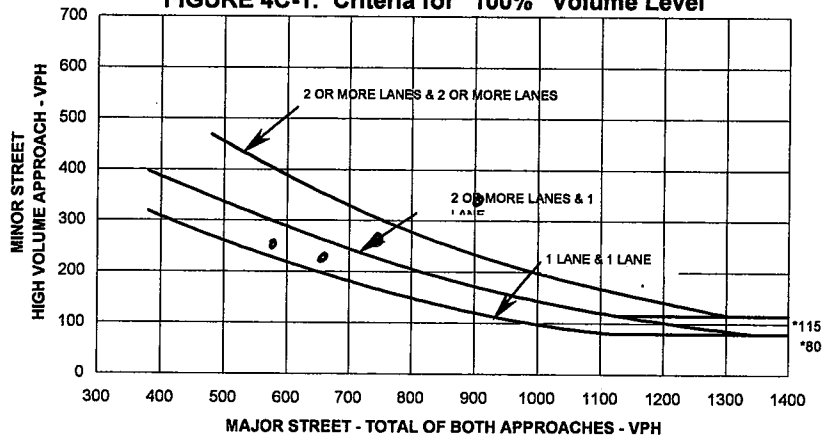
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

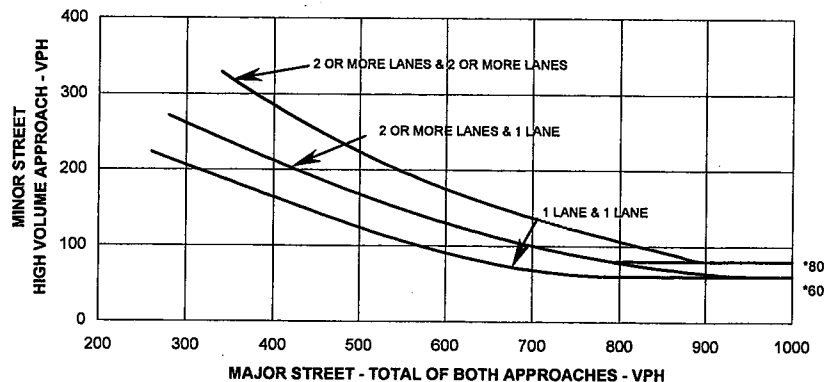
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
1400	585	257
1500	669	226
1600	745	267
1700	908	330

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/12/09  
Major Street: Sudbury St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Surface Rd. Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
700	908	1330

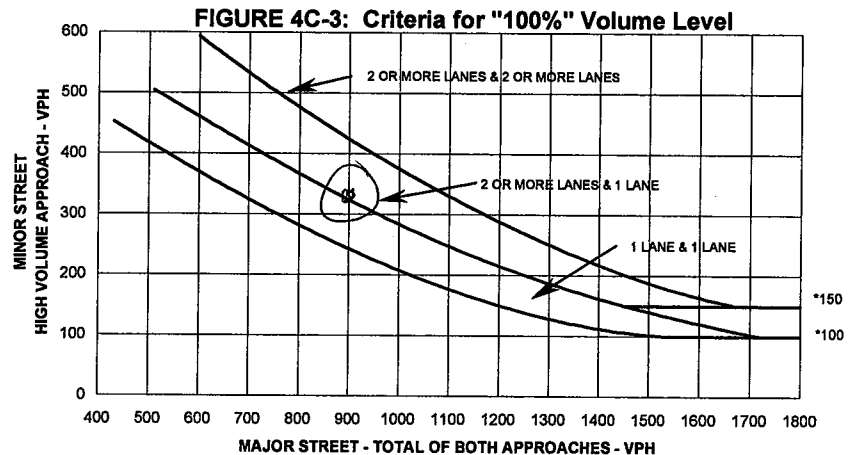
#### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

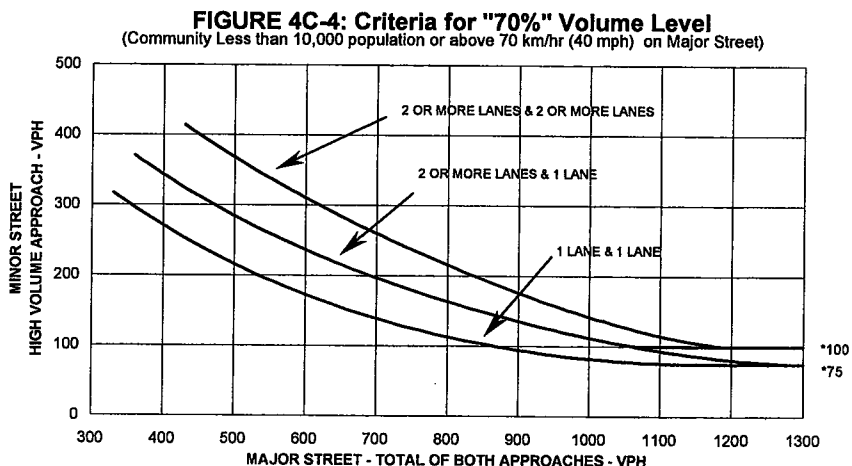
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		330
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1238	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Sudbury St.  
Minor Street: Surface Rd.

Engineer: A. Sil  
Date: 11/12/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	300	232			
	1500	259			
	1600	296			
	1700	023			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/12/08  
Major Street: Sudbury St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Surface Rd. Lanes: 2

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour						
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		<u>2</u>		<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: <u>1238</u>		<input checked="" type="checkbox"/>			
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant:	1 <u>N</u> 2 <u>N</u> 3 <u>N</u>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		<u>NO</u>	<u>DATA</u>	← Hour			
				← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

### CONCLUSIONS

Warrants Satisfied: 

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Remarks: \_\_\_\_\_  
\_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Silu  
County: Suffolk Date: 11/12/08  
Major Street: Cross St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Subbury St Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1000	1300	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	657	666	624	641	613	624	717	1023
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	235	264	235	355	433	499	605	722

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1000	1300	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	657	666	624	641	613	624	717	1023
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	235	264	235	355	433	499	605	722

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: CROSS ST.  
Minor Street: Sudbury St.

Engineer: A. Siu  
Date: 11/12/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

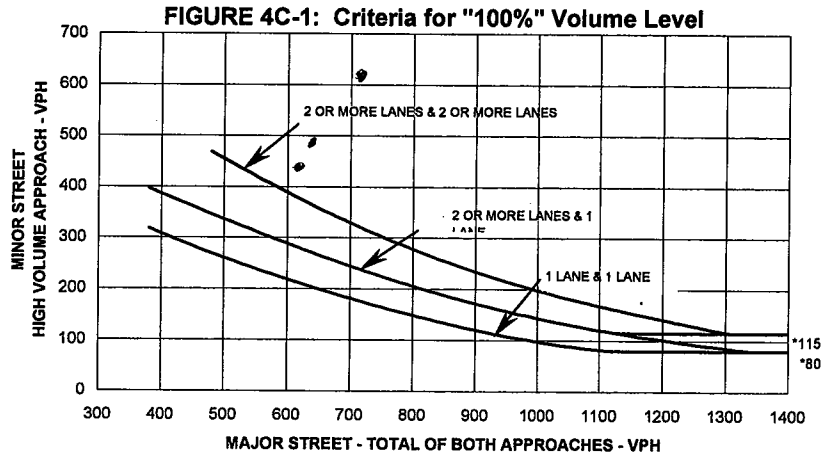
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

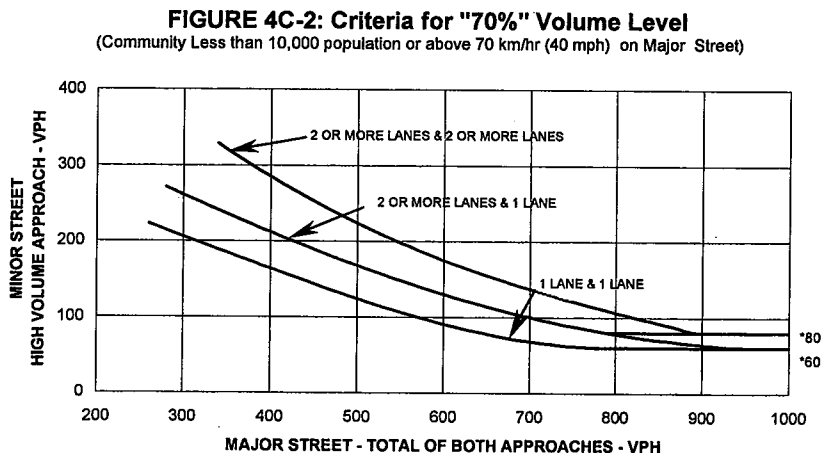
Plot four volume combinations on the applicable figure below.

*All points above line*

Four Highest Hours	Volumes	
	Major Street	Minor Street
1400	613	433
1500	624	499
1600	717	605
1700	1023	772



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/12/08  
Major Street: Cross St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Sudbury St. Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1400	1023	722

#### Criteria

##### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

##### 2. Volume on Minor Approach (vehicles per hour)

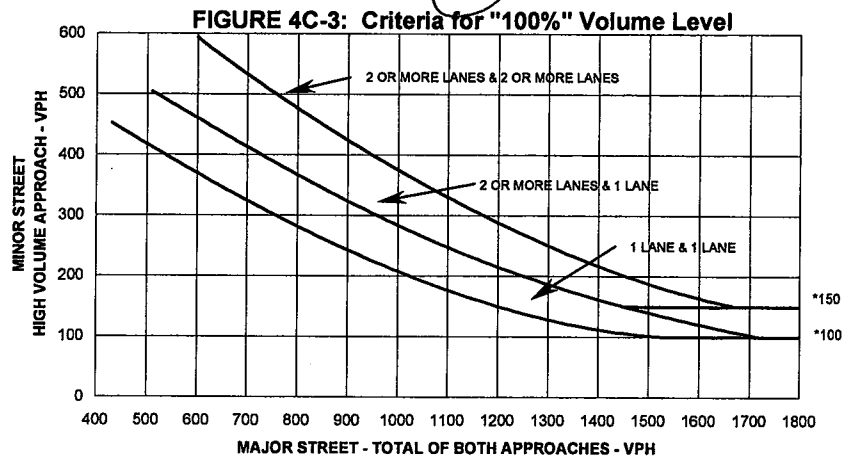
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		722
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

##### 3. Total Entering Volume (vehicles per hour)

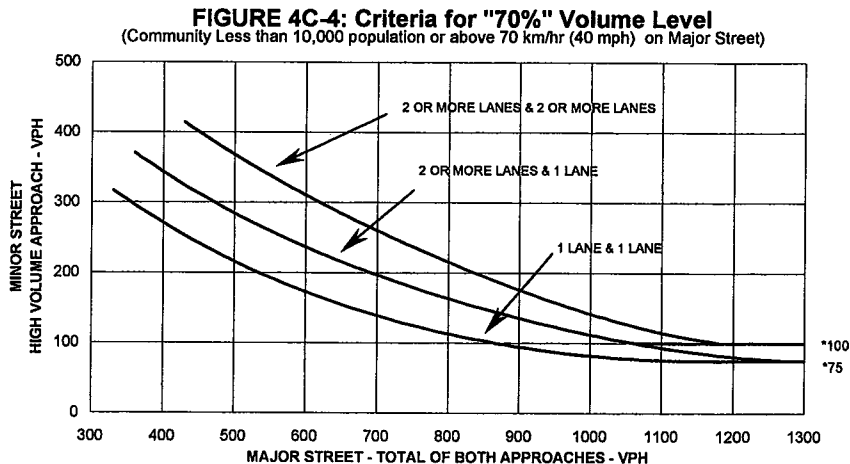
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1345	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/12/08  
Major Street: Cross St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Sudbury St. Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	<u>700</u>	<u>310</u>			
	<u>800</u>	<u>439</u>			
	<u>900</u>	<u>342</u>			
	<u>1700</u>	<u>356</u>			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				<input checked="" type="checkbox"/>	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/12/08  
Major Street: Cross St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Sudbury St Lanes: 2

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)		<input checked="" type="checkbox"/>			
	Warrant 1, Condition B (80% satisfied)			<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour					
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months: <u>2</u>					<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: <u>1745</u>	<input checked="" type="checkbox"/>	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant: <u>1</u> <u>2</u> <u>3</u> Satisfied?: <u>Y</u> <u>Y</u> <u>Y</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	<u>NO</u>	<u>DATA</u>	← Hour	
			← Volume	

Characteristics of Major Routes	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:			
	Minor Street:			
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:			
	Minor Street:			
3. Appears as a major route on an official plan.	Major Street:			
	Minor Street:			<input checked="" type="checkbox"/>

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/17/08

Major Street: SASB  
Minor Street: I-93, New Chardon

Lanes: 3  
Lanes: 2

Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1192	1394	1107	938	1040	1427	1553	1339
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	562	624	481	554	686	879	991	1017

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1192	1394	1107	938	1040	1427	1553	1339
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	562	624	481	554	686	879	991	1017

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. S. U.  
Date: 11/17/09

Major Street: SARB  
Minor Street: 1-93, New Chardon

Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

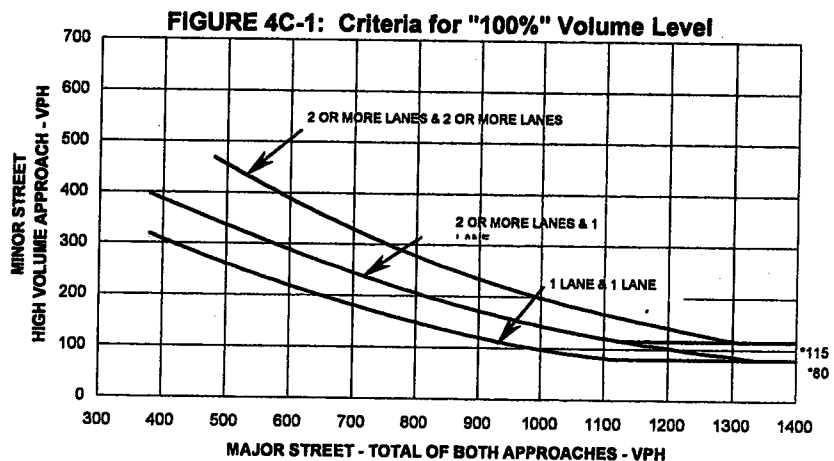
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

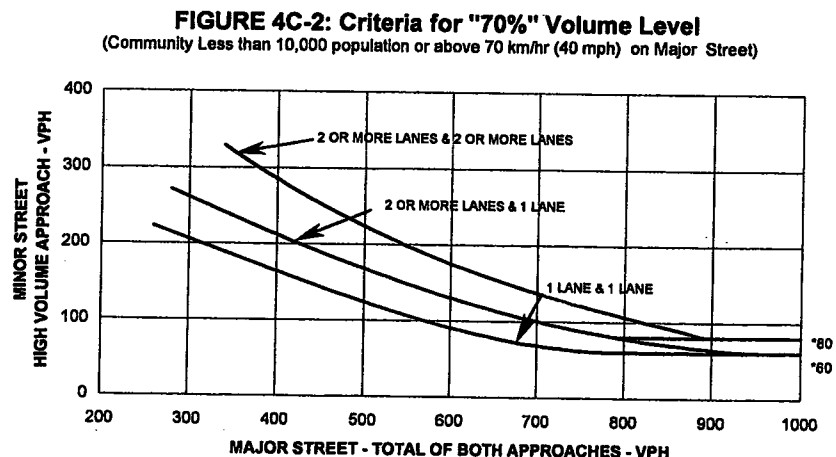
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1394	624
1500	1427	879
1600	1553	991
1700	1339	1017



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/17/09

Major Street: SAB  
Minor Street: I-93, New Chardon

Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1400	155	991

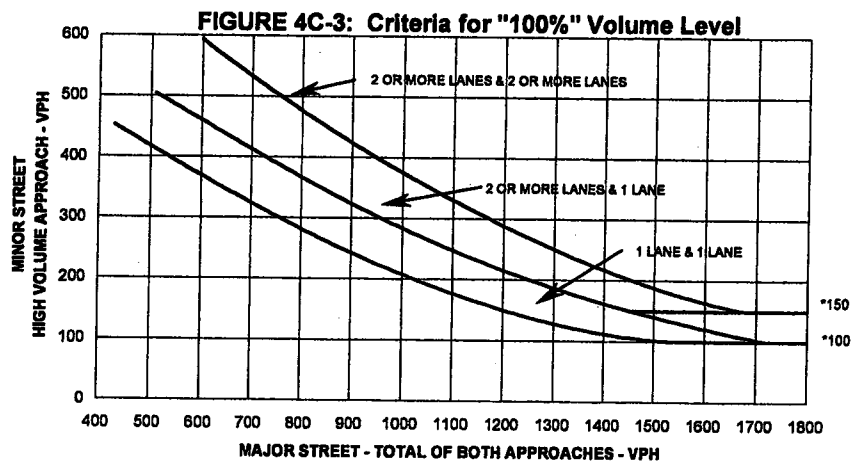
### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

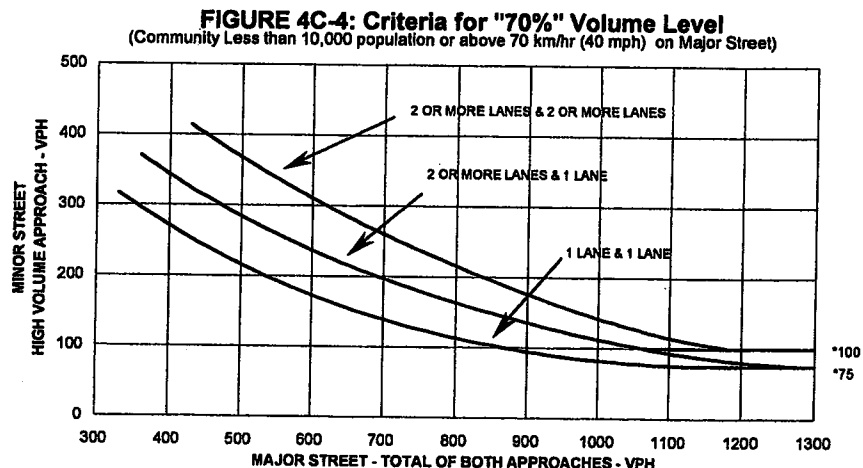
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		991
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	276	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/17/08

Major Street: SASB  
Minor Street: 193, New Chardon

Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8:00	59			X
	9:00	52			
	16:00	39			
	17:00	63			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3  
Lanes: 2

Critical Approach Speed: 30

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: SuffolkEngineer: A. Siu  
Date: 11/12/08Major Street: Cross St.  
Minor Street: I-93 rampLanes: 2 Critical Approach Speed: 30  
Lanes: 2**Volume Level Criteria**

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

**WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME**

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

**Condition A - Minimum Vehicular Volume**

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	553	654	727	646	659	670	806	943
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	170	154	187	96	124	151	142	136

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

**Condition B - Interruption of Continuous Traffic**

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	553	654	727	646	659	670	806	943
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	170	154	187	96	124	151	142	136

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

**WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME**

Delay is not excessive.

Not Applicable: ☐

**WARRANT 3 - PEAK HOUR**

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Silva  
Date: 11/12/08  
Major Street: Cross St.  
Minor Street: 1-93 ramps  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

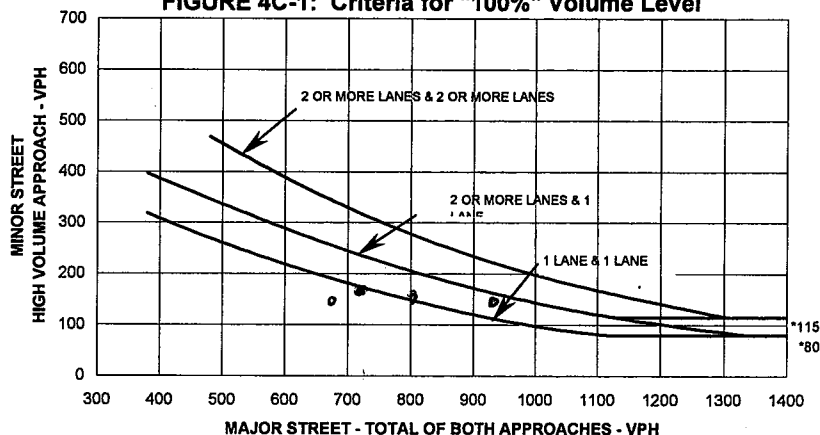
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

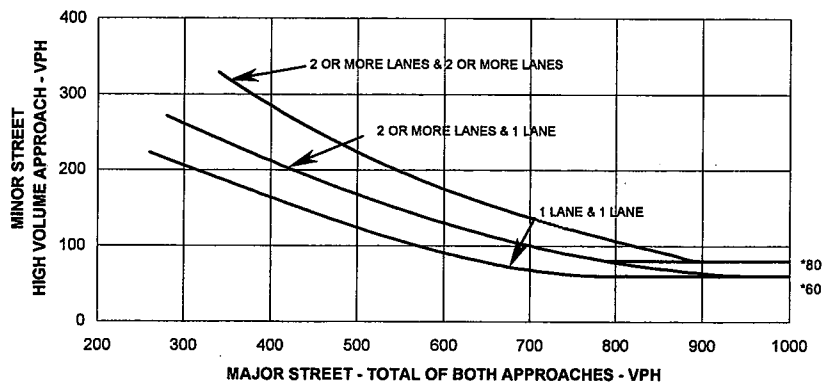
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
900	727	187
1500	670	151
1600	806	142
1700	943	136

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/12/08

Major Street: Cross St.  
Minor Street: I-93 ramps

Lanes: 2  
Lanes: 2

Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

\_\_\_\_\_

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	943	136

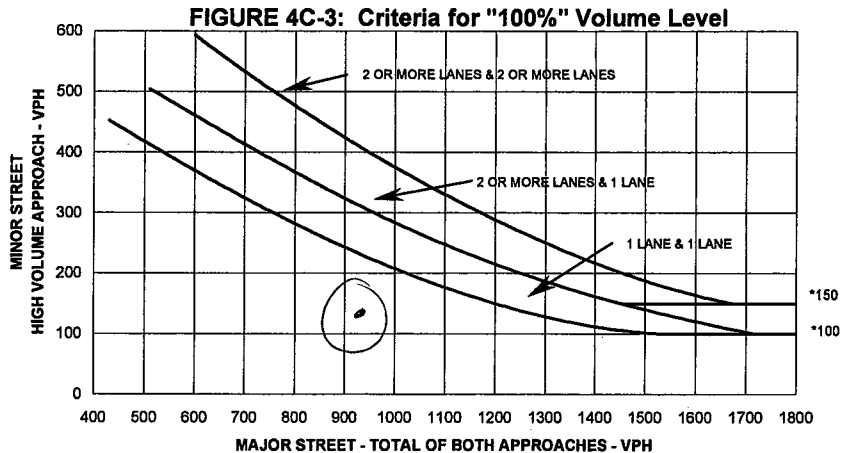
#### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

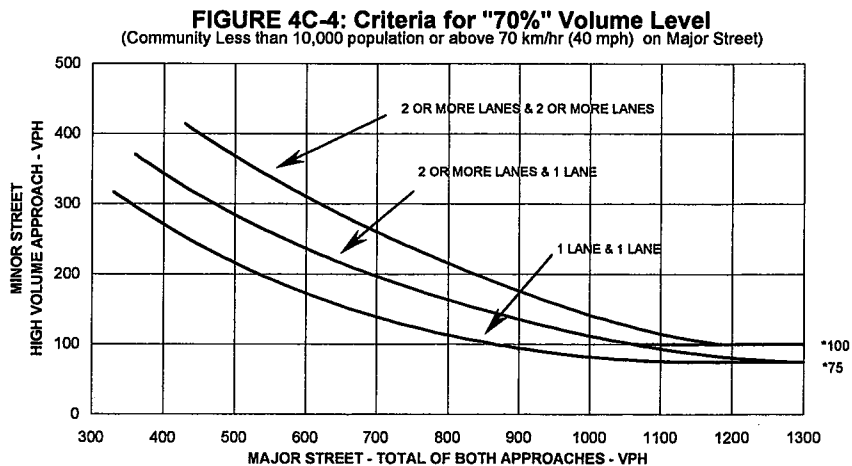
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		136
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1131	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sullivan  
Date: 11/12/09

Major Street: Cross St.  
Minor Street: I-93 Ramps

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	111			X
	12 <sup>00</sup>	90			
	16 <sup>00</sup>	86			
	17 <sup>00</sup>	111			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/12/08

Major Street: Cross St.  
Minor Street: I-93 ramps

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)			<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)			<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour					
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months: <u>0</u>					<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: <u>131</u>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant:	1 2 3		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
		Satisfied?:	N N N				
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	<u>N/A</u>		<u>DATA</u>	← Hour			
				← Volume			

Characteristics of Major Routes				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:						
	Minor Street:						
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:						
	Minor Street:						
3. Appears as a major route on an official plan.	Major Street:						
	Minor Street:						

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_



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## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sim  
County: Suffolk Date: 11/17/08  
Major Street: N. Washington Lanes: 5 Critical Approach Speed: 30  
Minor Street: Beverly Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1300	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1086	1142	930	715	814	1206	1314	1126
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	222	238	216	275	254	297	313	304

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1300	1400	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1036	1142	930	715	814	1206	1314	1126
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	222	238	216	275	254	297	313	304

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sim  
Date: 11/17/08  
Major Street: N. Washington  
Minor Street: Beverly  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

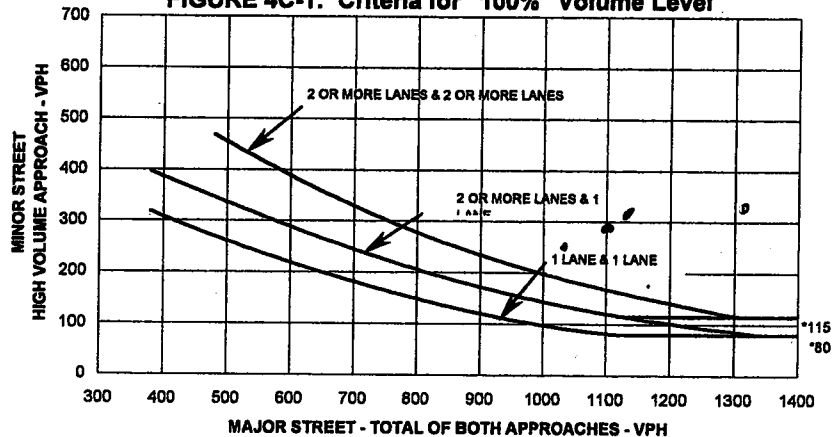
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

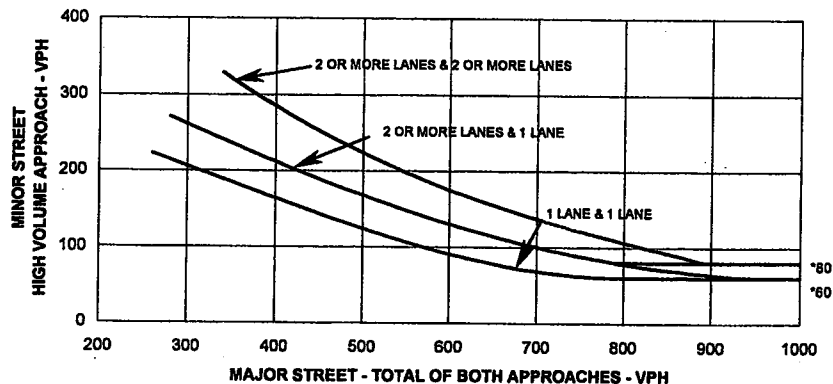
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1142	238
1500	1206	297
1600	1314	313
1700	1126	304

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/17/08

Major Street: N. Washington  
Minor Street: Beverly

Lanes: 3  
Lanes: 2

Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
1600	1314	213

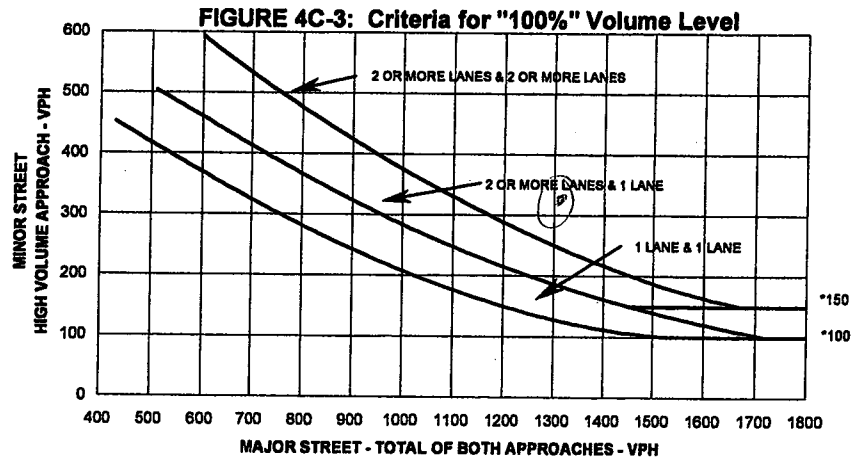
#### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

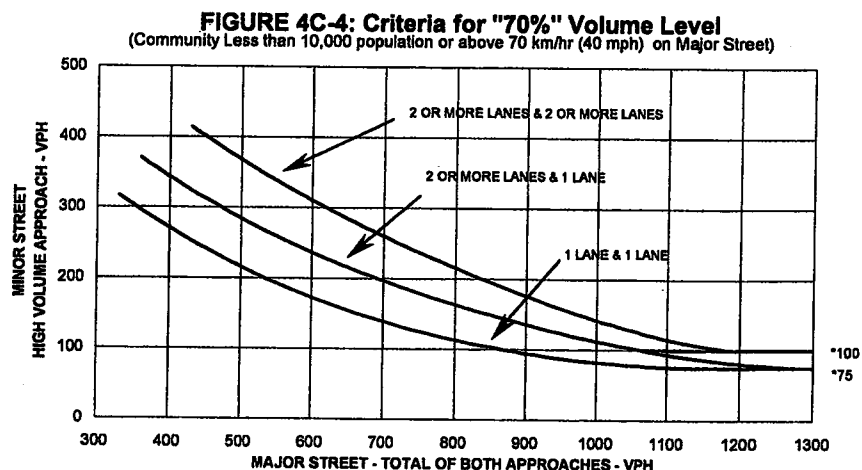
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		513
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1627	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 11/17/08

Major Street: N. Washington  
Minor Street: Beverly

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	700	28			X
	800	67			
	1600	36			
	1700	27			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Engineer: A. Siu  
Date: 11/17/08  
Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

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# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
 County: Suffolk Date: 11/17/08  
 Major Street: Valenti Lanes: 1 Critical Approach Speed: 30  
 Minor Street: Beverly Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
 Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☐ Yes ☒ No  
 Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☐ No  
 80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420								
Highest Approach on Minor Street	150 (120)	105	200 (160)	140								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☐ Yes ☒ No  
 Excessive Delay: ☐ Yes ☒ No  
 100% Satisfied: ☐ Yes ☐ No  
 80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630								
Highest Approach on Minor Street	75 (60)	53	100 (80)	70								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☒

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☒

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/17/08  
Major Street: Valenti Lanes: 1 Critical Approach Speed: 30  
Minor Street: Beverly Lanes: 2

## Volume Level Criteria

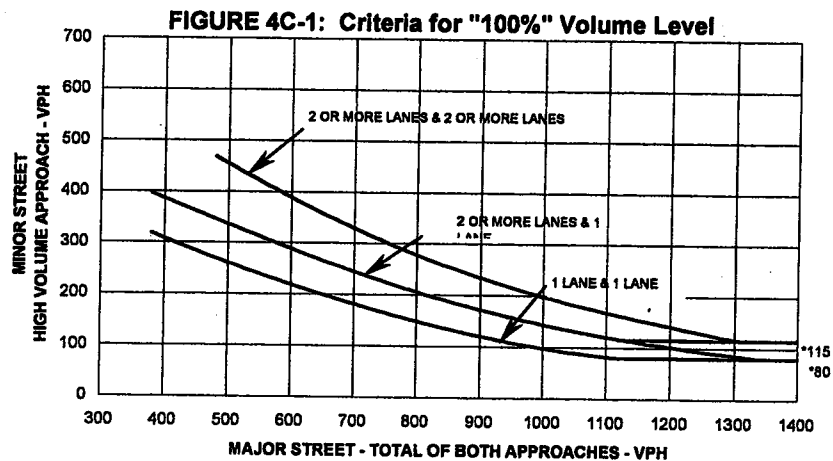
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

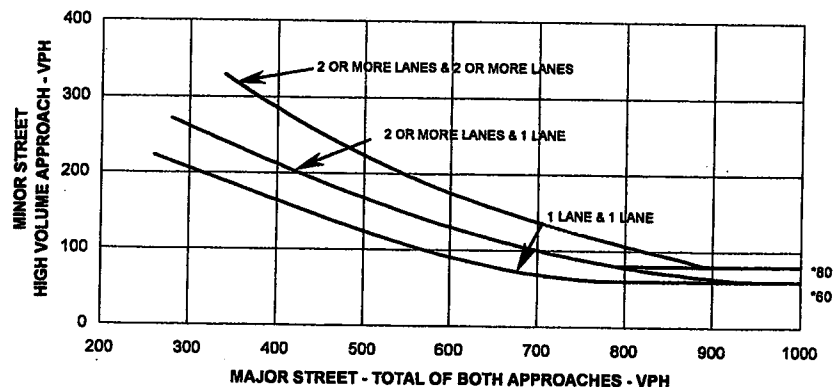
Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

**FIGURE 4C-2: Criteria for "70%" Volume Level**  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Valenti  
Minor Street: Beverly

Engineer: A. Siu  
Date: 11/17/08  
Lanes: 1  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		

#### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

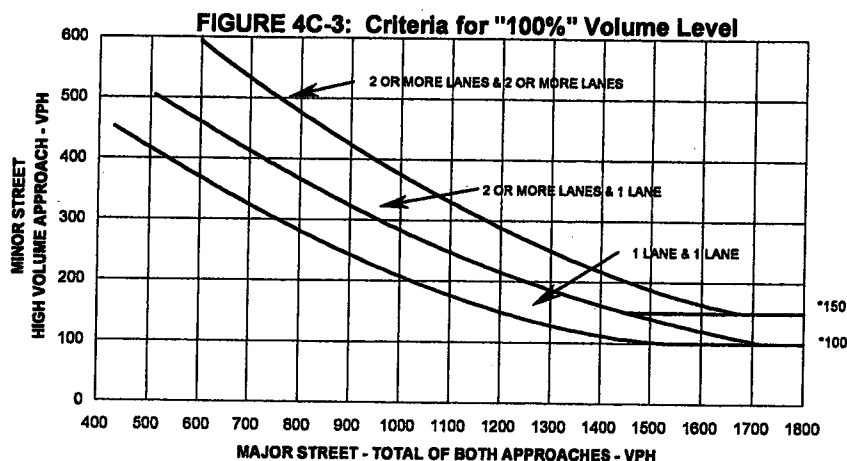
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

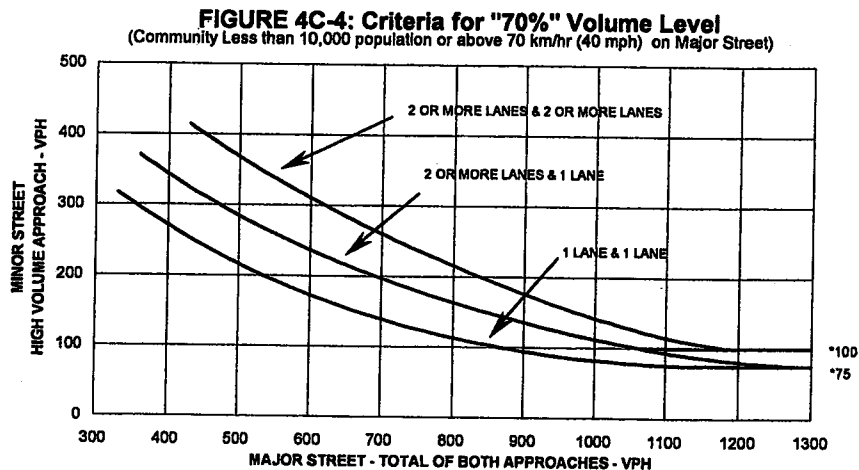
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sil  
Date: 11/17/08

Major Street: Valenti  
Minor Street: Beverly

Lanes: 1 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7:00	13			X
	8:00	16			
	12:00	10			
	16:00	10			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Engineer: A. Siu  
Date: 11/17/06  
Lanes: 1 Critical Approach Speed: 30  
Lanes: 2

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?		
				Yes	No	Yes	No	
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				X		X	
	Warrant 1, Condition B (80% satisfied)				X			
	Warrant 4, Pedestrian Volume at 80% of volume requirements: 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour				X			
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:						
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:					X

Criteria							Met?		Fulfilled?		
							Yes	No	Yes	No	
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.				Entering Volume:						
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.			Warrant:	1	2	3				
				Satisfied?:							
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)								← Hour			
								← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

Warrants Satisfied: 

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Source: Revised from NCHRP Report 457

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/12/08  
Major Street: North Washington Lanes: 2 Critical Approach Speed: 30  
Minor Street: Valenti Lanes:     

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420								
Highest Approach on Minor Street	150 (120)	105	200 (160)	140								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☐ Yes ☒ No  
Excessive Delay: ☐ Yes ☒ No  
100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630								
Highest Approach on Minor Street	75 (60)	53	100 (80)	70								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☒

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☒

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Silva  
County: Suffolk Date: 6/12/08  
Major Street: North Washington Lanes:      Critical Approach Speed: 30  
Minor Street: Valenti Lanes:     

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

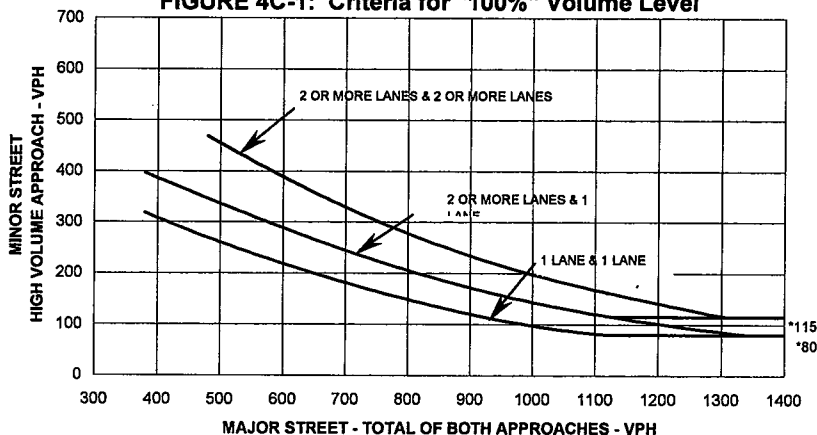
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

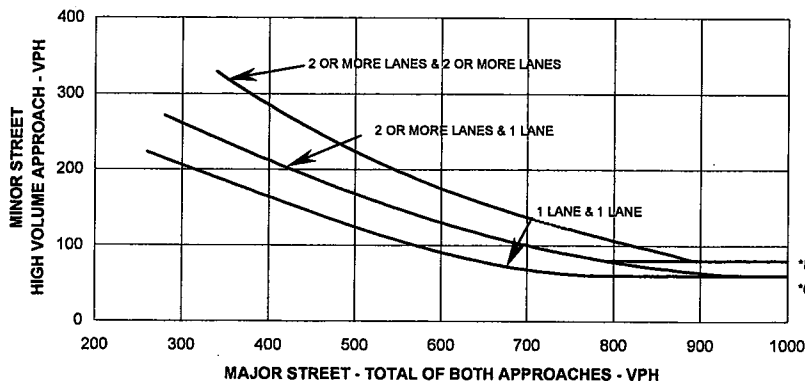
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: N. Washington  
Minor Street: Valenti

Engineer: A. Sullivan  
Date: 11/12/08  
Lanes: \_\_\_\_\_  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		

#### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

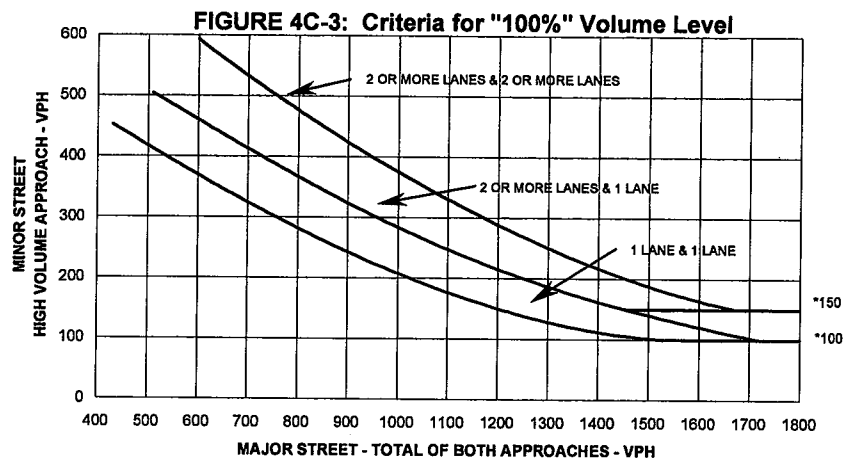
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

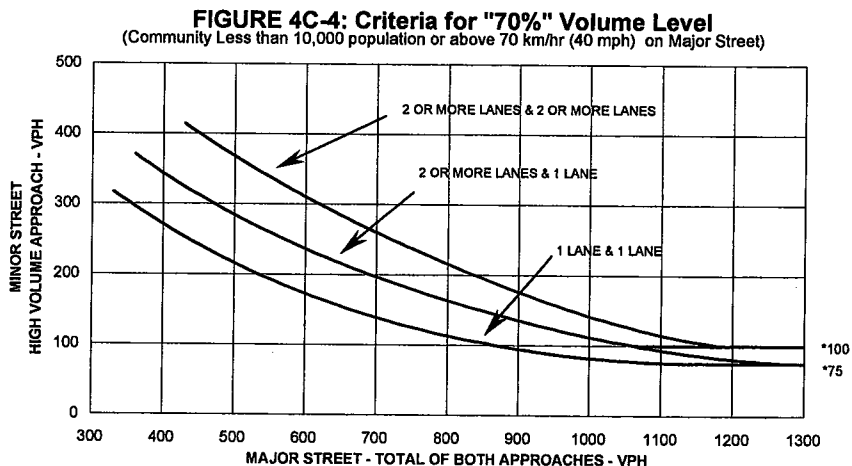
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: N. Washington  
Minor Street: Valenti

Engineer: A. Siu  
Date: 11/12/09  
Lanes: \_\_\_\_\_  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	700	160			
	800	263			
	1700	200			
	1700	245			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students: _____	Hour: _____
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes: _____	Gaps: _____
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/12/08  
Major Street: N. Washington Lanes: \_\_\_\_\_ Critical Approach Speed: 30  
Minor Street: Valentine Lanes: \_\_\_\_\_

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour						
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		<u>1</u>		<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume:				
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant:	1	2	3	
			Satisfied?:				
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)						← Hour	
						← Volume	

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/17/08  
Major Street: Atlantic Lanes: 3 Critical Approach Speed: 30  
Minor Street: Congress Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420	942	1097	830	710	663	578	664	748
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	539	718	650	584	620	706	884	1075

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630	942	1097	830	710	663	578	664	748
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	539	718	650	584	620	706	884	1075

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic  
Minor Street: Congress

Engineer: A. Sin  
Date: 11/17/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

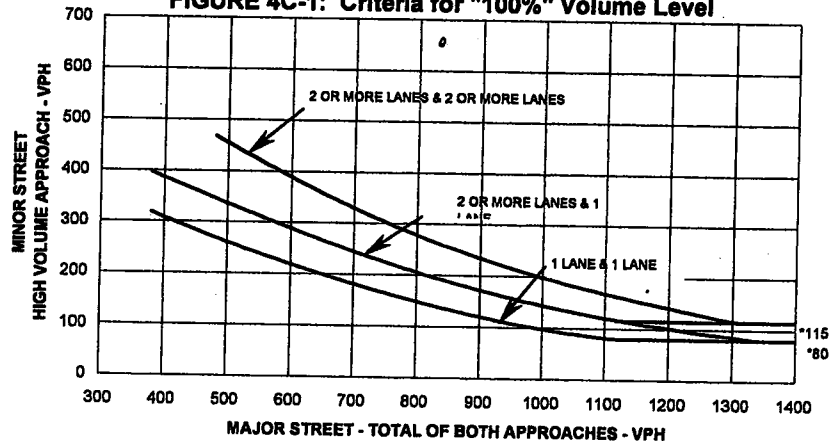
## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

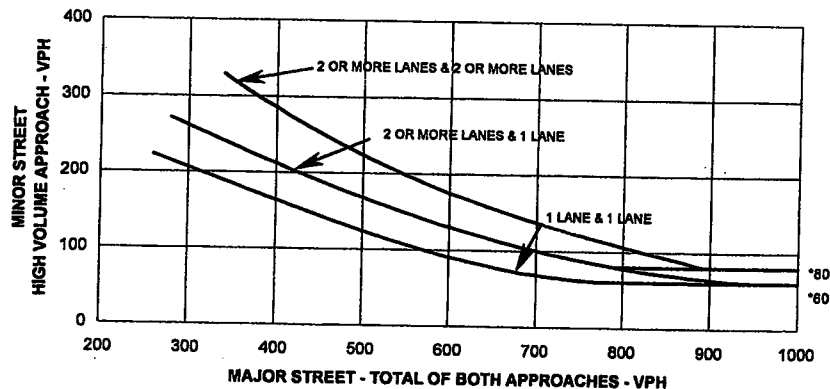
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	1097	718
9 <sup>00</sup>	830	650
16 <sup>00</sup>	664	884
17 <sup>00</sup>	748	1075

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. SIM  
Date: 11/17/08

Major Street: Atlantic  
Minor Street: Congress

Lanes: 3  
Lanes: 2

Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	740	1075

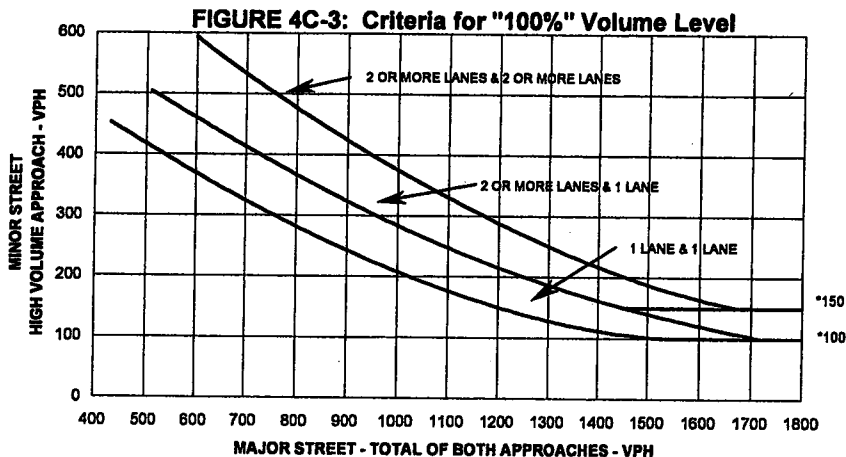
#### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

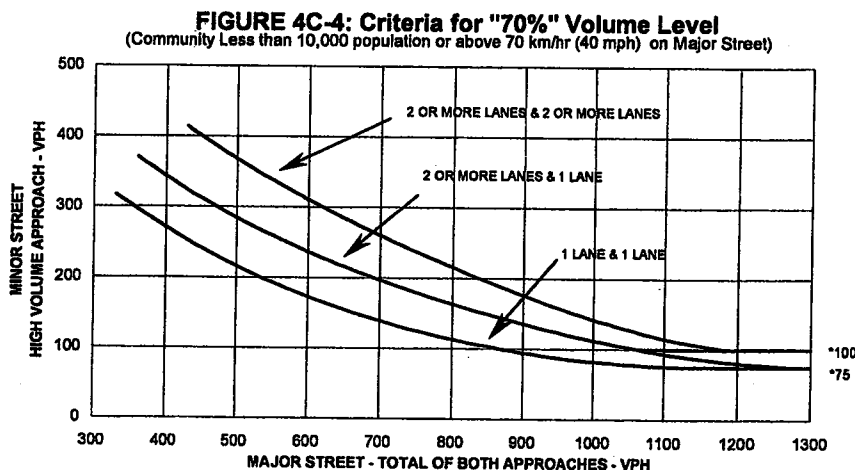
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		1075
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	2789	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sullivan  
County: Suffolk Date: 11/17/08  
Major Street: Athletic Lanes: 3 Critical Approach Speed: 30  
Minor Street: Congress Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	800	184			
	1200	195			
	1600	197			
	1900	295			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3  
Lanes: 2

Critical Approach Speed: 30

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/17/08  
Major Street: Atlantic Lanes: 3 Critical Approach Speed: 30  
Minor Street: Summer Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	13 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1425	1695	1185	1001	941	909	871	1047
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	464	451	426	419	447	393	485	525

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	13 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1425	1695	1185	1001	941	909	871	1047
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	464	451	426	419	447	393	485	525

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic  
Minor Street: Summer

Engineer: A. Silva  
Date: 11/17/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

☐ 70% ☒ 100%

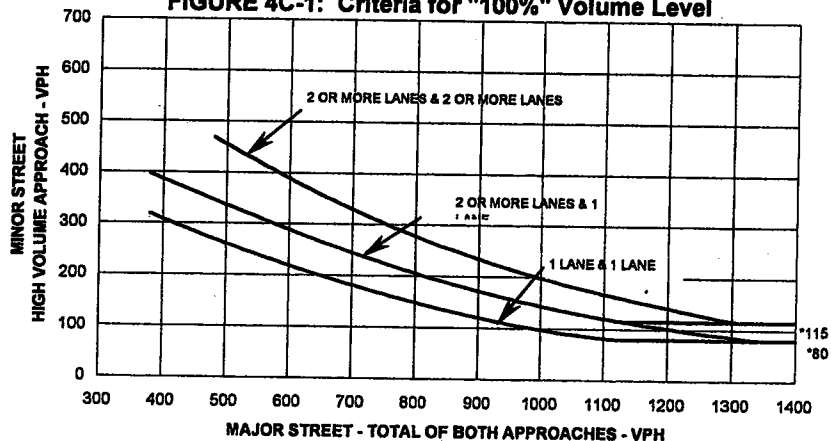
## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

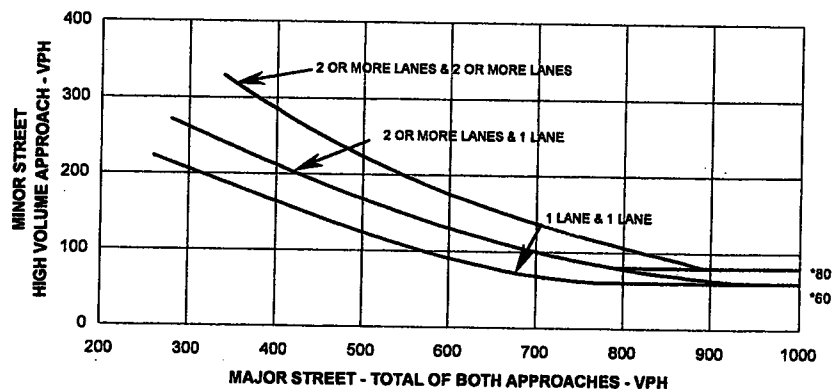
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1425	464
800	1695	451
900	1185	426
1700	1047	525

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/17/00  
Major Street: Atlantic Lanes: 3 Critical Approach Speed: 30  
Minor Street: Summer Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
8 <sup>00</sup>	16 <sup>45</sup>	4 <sup>51</sup>

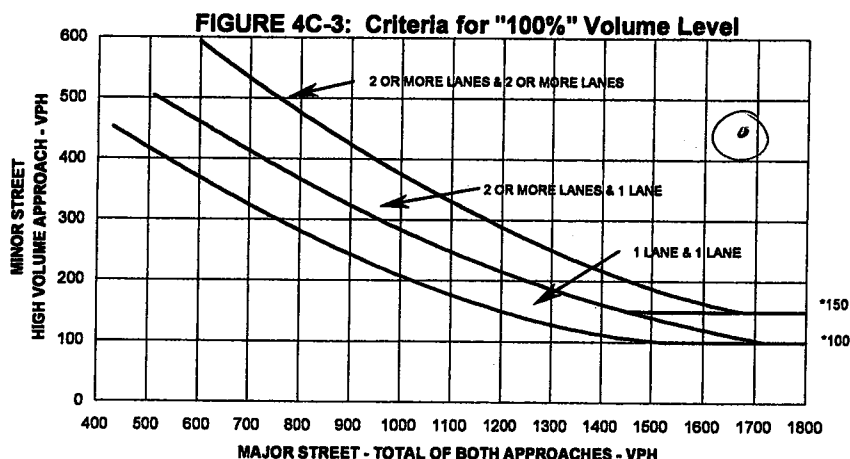
#### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

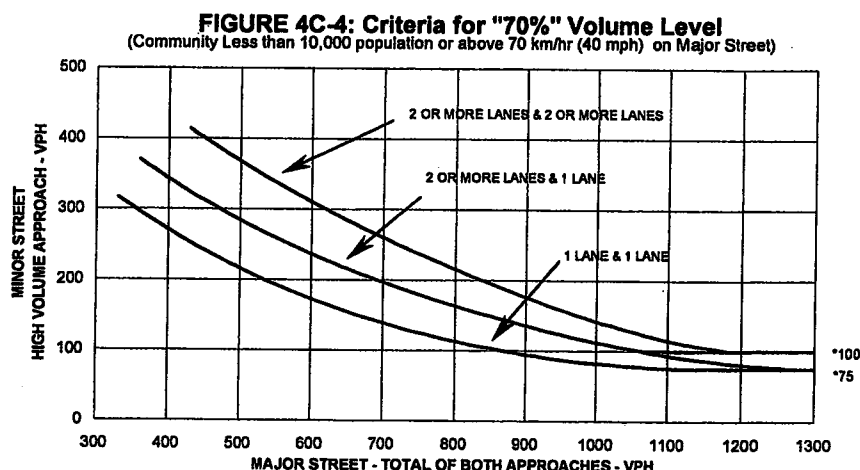
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Silu  
Date: 11/17/08  
Major Street: Atlantic  
Minor Street: Summer  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	2959			
	9 <sup>00</sup>	4943			
	16 <sup>00</sup>	4021			
	17 <sup>00</sup>	4146			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		





## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sim  
Date: 11/17/08

Major Street: Atlantic  
Minor Street: Essex

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	1 <sup>00</sup>	1 <sup>30</sup>
Approach Lanes	100%	70%	100%	70%								
Volume Level	500 (400)	350	600 (480)	420	1329	1534	1093	878	830	731	697	833
Both Approaches on Major Street	150 (120)	105	200 (160)	140	155	258	189	196	200	194	264	317
Highest Approach on Minor Street												

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☒ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	1 <sup>00</sup>	1 <sup>30</sup>
Approach Lanes	100%	70%	100%	70%								
Volume Level	750 (600)	525	900 (720)	630	1329	1534	1093	878	830	731	697	833
Both Approaches on Major Street	75 (60)	53	100 (80)	70	155	258	189	196	200	194	264	317
Highest Approach on Minor Street												

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. S. I. A.  
Date: 11/17/08

Major Street: Atlantic  
Minor Street: Essex

Lanes: 5  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

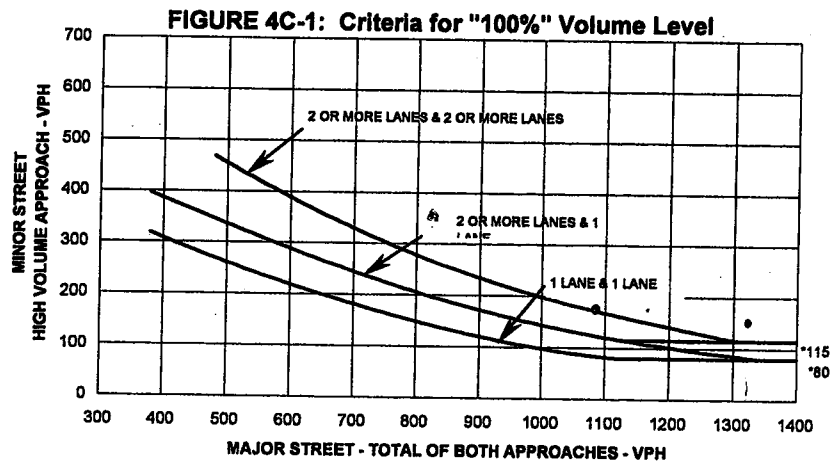
1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

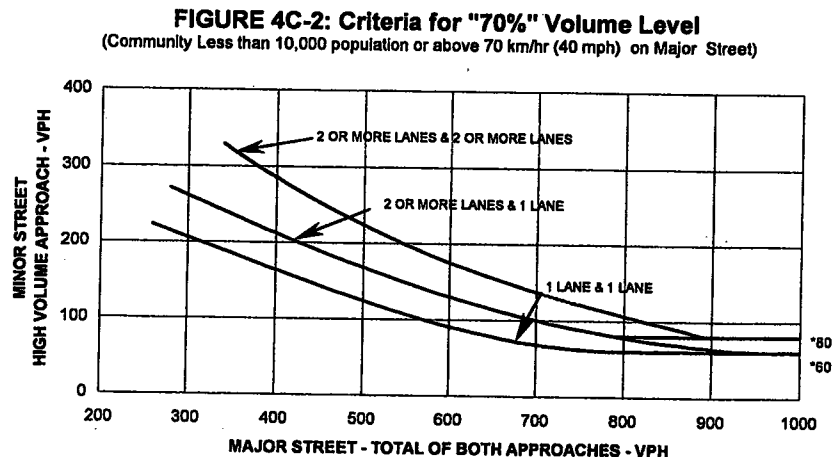
Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1329	155
800	1534	258
900	1093	189
1700	833	317



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A.Siu  
Date: 11/17/08

Major Street: Atlantic  
Minor Street: Essex

Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
800	1534	258

#### Criteria

#### 1. Delay on Minor Approach \*(vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

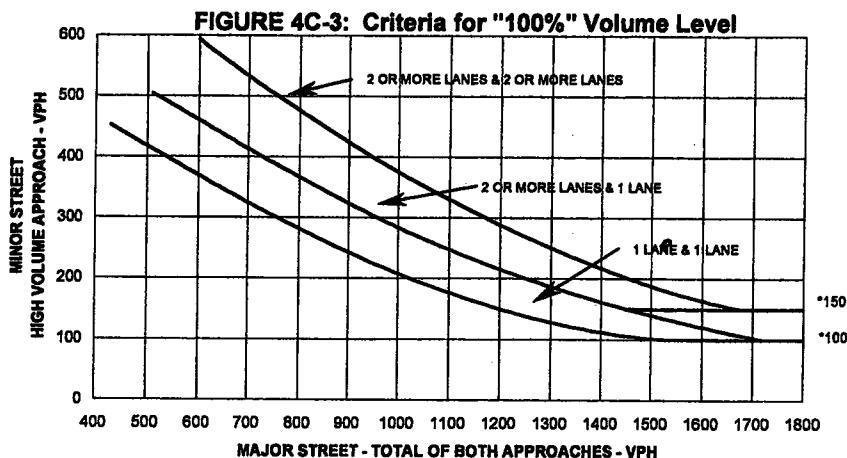
#### 2. Volume on Minor Approach \*(vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		258
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

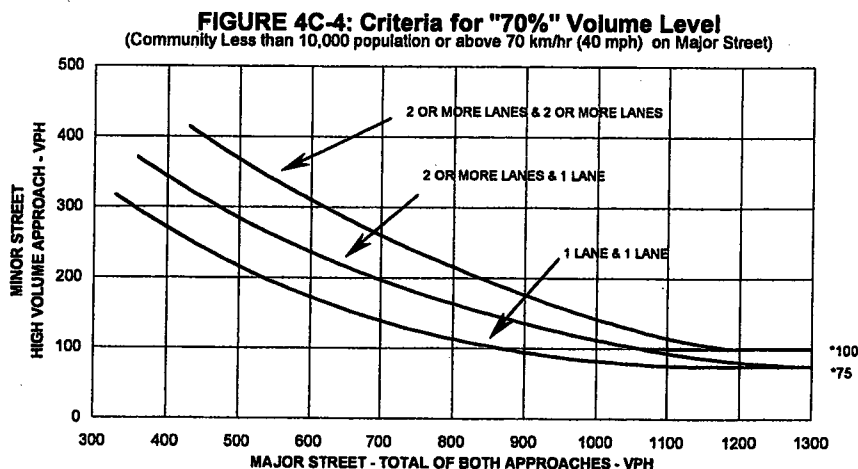
#### 3. Total Entering Volume \*(vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1792	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic  
Minor Street: Essex

Engineer: A. Sullivan  
Date: 11/17/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	700	965			
	800	1726			
	1600	1219			
	1700	1427			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic  
Minor Street: Essex

Engineer: A. Siu  
Date: 11/17/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)			<input checked="" type="checkbox"/>			
	Warrant 4, Pedestrian Volume at 80% of volume requirements:						
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months: <u>2</u>				<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria					Met?		Fulfilled?	
					Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume: <u>1792</u>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant:	1 2 3	<input checked="" type="checkbox"/>			
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		<u>NO</u>	<u>DATA</u>		← Hour			
					← Volume			

Characteristics of Major Routes			Met?		Fulfilled?	
			Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				<input checked="" type="checkbox"/>	
	Minor Street:					
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:					
	Minor Street:					
3. Appears as a major route on an official plan.	Major Street:					
	Minor Street:					

### CONCLUSIONS

Warrants Satisfied: 

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Remarks: \_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 11/17/08

Major Street: Atlantic  
Minor Street: Beach

Lanes: 3 Critical Approach Speed: 30  
Lanes: \_\_\_\_\_

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420								
Highest Approach on Minor Street	150 (120)	105	200 (160)	140								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☐ Yes ☒ No  
Excessive Delay: ☐ Yes ☒ No  
100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630								
Highest Approach on Minor Street	75 (60)	53	100 (80)	70								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☒

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☒

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Silva  
County: Suffolk Date: 11/17/08  
Major Street: Atlantic Lanes: 3 Critical Approach Speed: 30  
Minor Street: Beach Lanes:     

### Volume Level Criteria

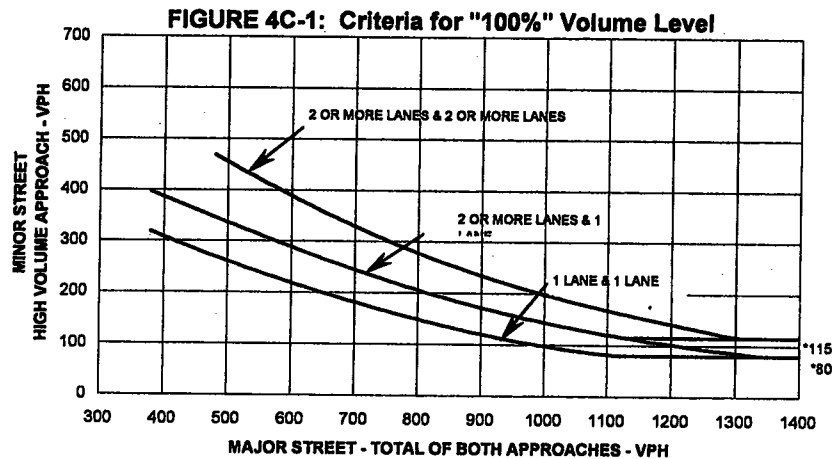
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

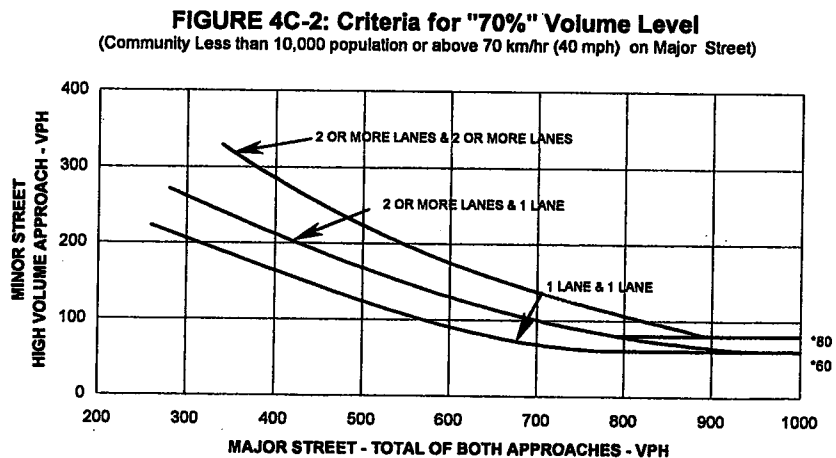
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/17/08  
Major Street: Atlantic Lanes: 3 Critical Approach Speed: 30  
Minor Street: Beach Lanes:     

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		

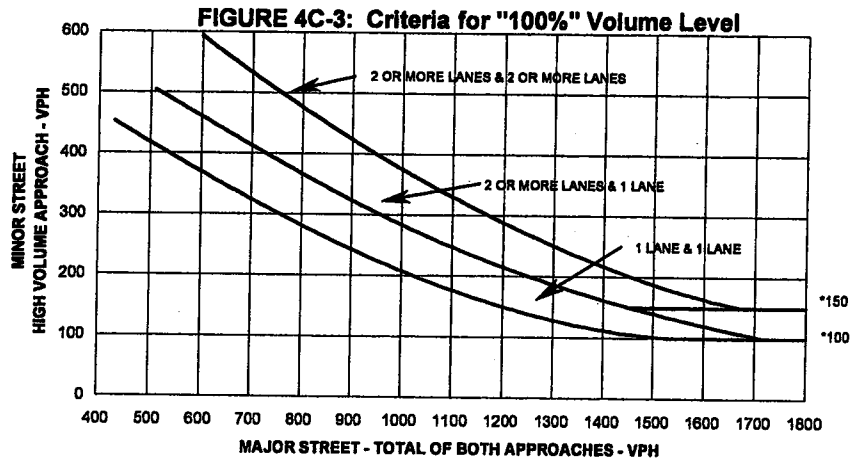
#### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

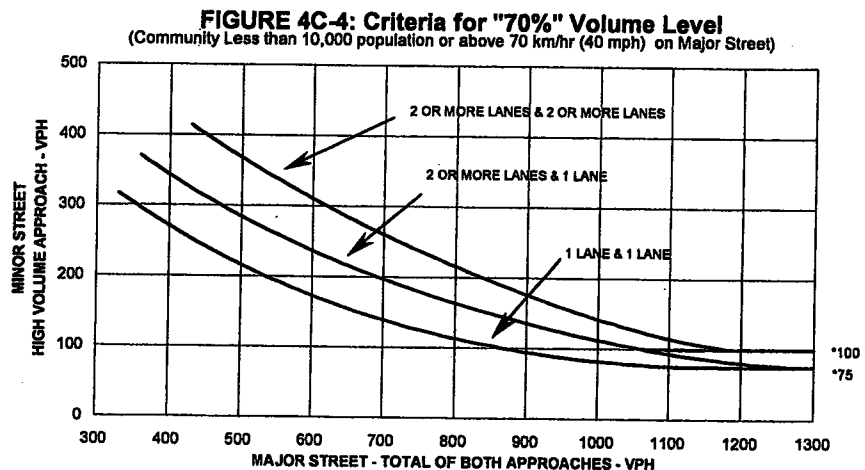
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Atlantic  
Minor Street: Beach

Engineer: A. Sullivan  
Date: 11/17/08  
Lanes: 3 Critical Approach Speed: 30  
Lanes: \_\_\_\_\_

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	282			
	12 <sup>00</sup>	285			
	16 <sup>00</sup>	382			
	17 <sup>00</sup>	374			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				<input checked="" type="checkbox"/>	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/17/08  
Major Street: Atlantic Lanes: 3 Critical Approach Speed: 30  
Minor Street: Beach Lanes:     

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				X		
	Warrant 1, Condition B (80% satisfied)				X		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:						
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour			X		X	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months: <u>2</u>				X

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume:			
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant:	1	2	3
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)					
				← Hour	
				← Volume	

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_  
\_\_\_\_\_

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
 County: Suffolk  
 Engineer: A. Siu  
 Date: 11/17/08  
 Major Street: I-93 ramp  
 Minor Street: Frontage / Kneeland  
 Lanes: 2  
 Lanes: 2  
 Critical Approach Speed: 30

**Volume Level Criteria**

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
 2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
 If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

**WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME**

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
 Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☒ Yes ☒ No

**Condition A - Minimum Vehicular Volume**

100% Satisfied: ☐ Yes ☒ No  
 80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1101	1383	928	535	508	385	417	515
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	414	420	414	465	406	388	351	365

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

**Condition B - Interruption of Continuous Traffic**

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
 Excessive Delay: ☐ Yes ☐ No  
 100% Satisfied: ☐ Yes ☒ No  
 80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1101	1383	928	535	508	385	417	515
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	414	420	414	465	406	388	351	365

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

**WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME**

Delay is not excessive.

Not Applicable: ☐

**WARRANT 3 - PEAK HOUR**

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sin  
Date: 11/17/08

Major Street: I-93 ramp  
Minor Street: Frontage, Kneeland

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

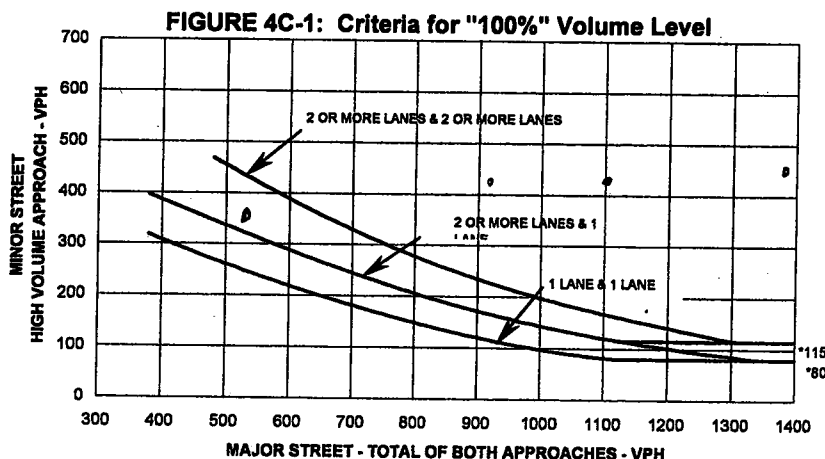
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

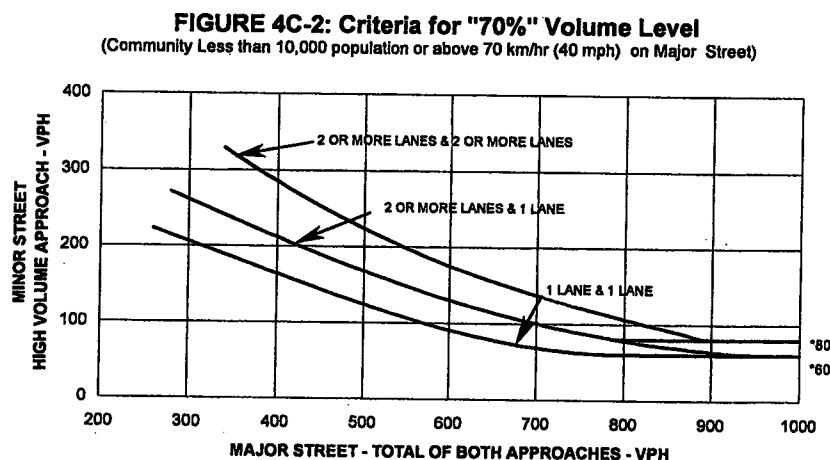
Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1101	414
800	1383	420
900	928	414
1000	535	365



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: I-93 ramp  
Minor Street: Frontage, Kneeland

Engineer: A.S.W.  
Date: 11/17/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
8 <sup>00</sup>	1393	470

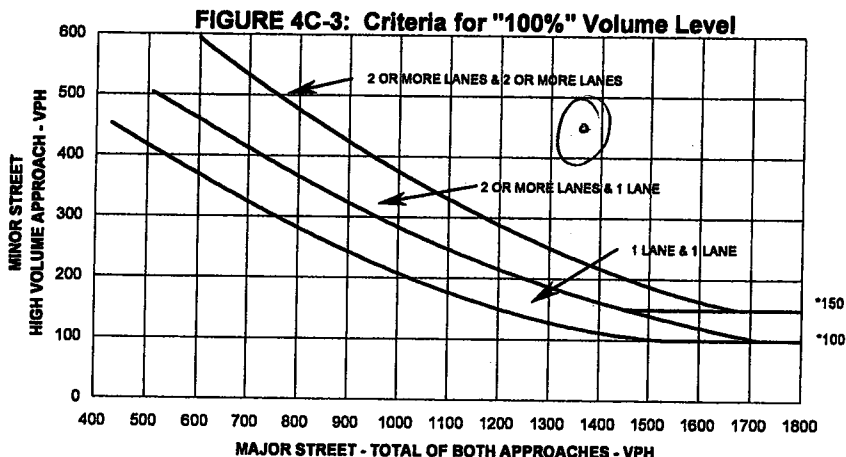
### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

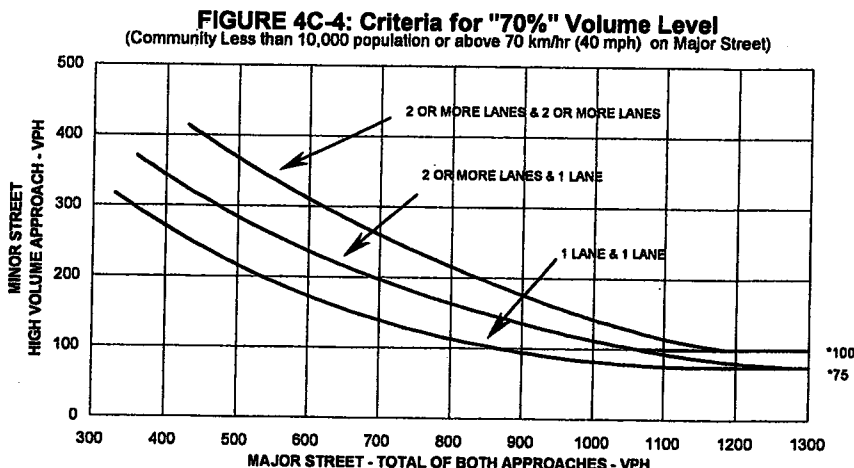
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		470
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	2274	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/17/08  
Major Street: I-93 ramp  
Minor Street: Frontage, kneeland  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	1300	82			
	1500	135			
	1600	233			
	1700	127			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		233			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/17/08  
Major Street: I-93 ramp Lanes: 2 Critical Approach Speed: 30  
Minor Street: Frontage, Kneeland Lanes: 2

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)			<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)			<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:					
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months: <u>7</u>				<input checked="" type="checkbox"/>	

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: <u>2224</u>	<input checked="" type="checkbox"/>	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant: <u>1</u> <u>2</u> <u>3</u> Satisfied?: <u>W</u> <u>N</u> <u>Y</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	<u>NO</u>	<u>DATA</u>	← Hour	
			← Volume	

Characteristics of Major Routes	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:			
	Minor Street:			
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:			
	Minor Street:			
3. Appears as a major route on an official plan.	Major Street:			
	Minor Street:			

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: North St.  
Minor Street: Clinton St.

Engineer: A. Silva  
Date: 11/12/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1400	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	656	796	852	686	720	609	522	555
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	254	297	265	365	302	233	298	258

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1400	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	656	796	852	686	720	609	522	555
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	254	297	265	365	302	233	298	258

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Silva  
County: Suffolk Date: 11/12/08  
Major Street: North St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Clinton St. Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

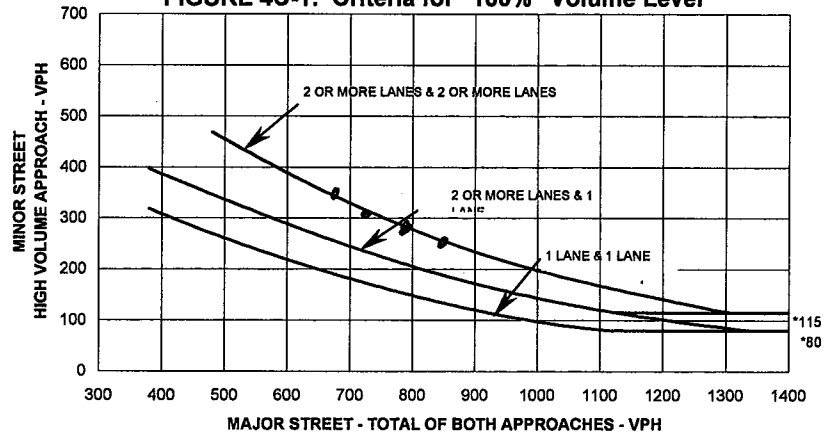
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

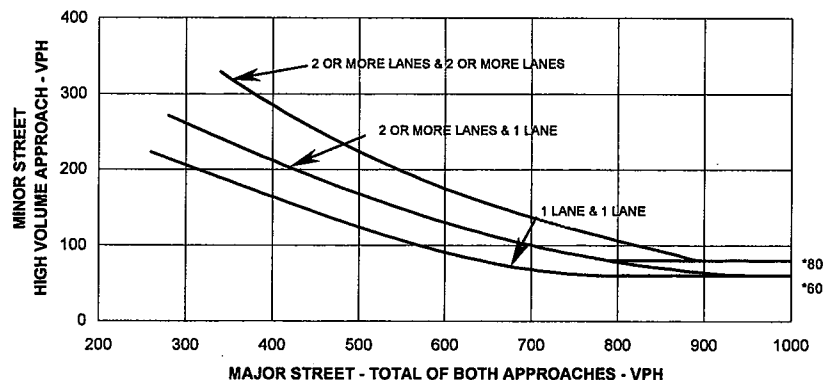
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	796	297
960	852	265
1000	686	365
1100	720	302

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/17/08  
Major Street: North St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Clinton St. Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Unusual condition justifying use of warrant:

\_\_\_\_\_

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
900	852	265

#### Criteria

##### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

##### 2. Volume on Minor Approach (vehicles per hour)

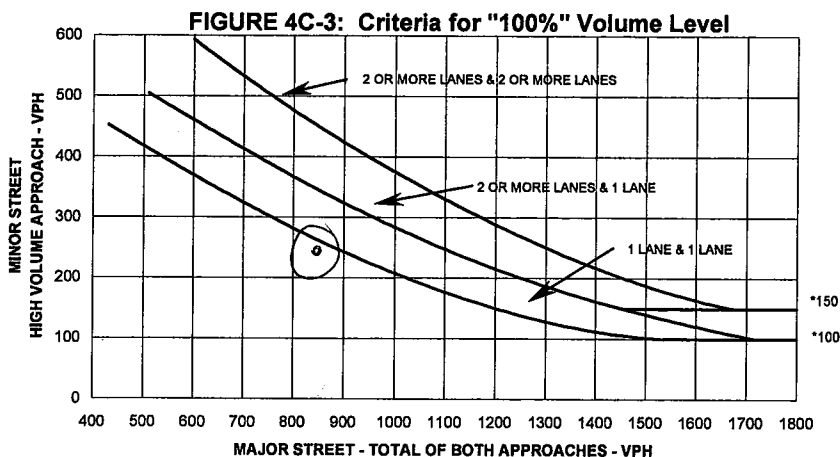
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		205
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

##### 3. Total Entering Volume (vehicles per hour)

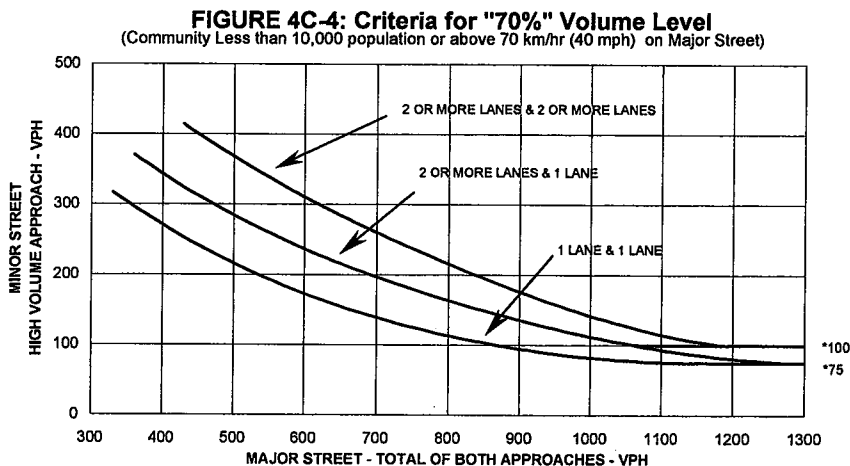
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1117	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sil  
County: Suffolk Date: 11/12/08  
Major Street: North St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Clinton St. Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	11 <sup>00</sup>	299			
	12 <sup>00</sup>	429			
	14 <sup>00</sup>	279			
	17 <sup>00</sup>	242			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				<input checked="" type="checkbox"/>	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students: <input type="text"/>	Hour: <input type="text"/>
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes: <input type="text"/>	Gaps: <input type="text"/>
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 11/12/08  
Major Street: North St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Clinton St. Lanes: 2

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)		<input checked="" type="checkbox"/>			
	Warrant 1, Condition B (80% satisfied)			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	Warrant 4, Pedestrian Volume at 80% of volume requirements:		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour					
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months:					<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: <u>1117</u>	<input checked="" type="checkbox"/>	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant: 1 2 3	<input checked="" type="checkbox"/>	
		Satisfied?: <u>y</u> <u>y</u> <u>n</u>	<input checked="" type="checkbox"/>	
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	<u>NO</u>	<u>DATA</u>	← Hour	
			← Volume	

Characteristics of Major Routes	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:			<input checked="" type="checkbox"/>
	Minor Street:			
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:			
	Minor Street:			
3. Appears as a major route on an official plan.	Major Street:			
	Minor Street:			

### CONCLUSIONS

Warrants Satisfied: 

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Remarks: \_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 11/17/08  
Major Street: Purchase  
Minor Street: Fire Station / Garage  
Lanes: 3  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1300	1400
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1045	1273	1211	1017	1120	1367	1550	1341
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	19	18	16	22	50	119	149	181

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1300	1400
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1045	1273	1211	1017	1120	1367	1550	1341
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	19	18	16	22	50	119	149	181

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 11/17/09

Major Street: Purchase  
Minor Street: Fire station / Garage

Lanes: 3 Critical Approach Speed: 30  
Lanes:     

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

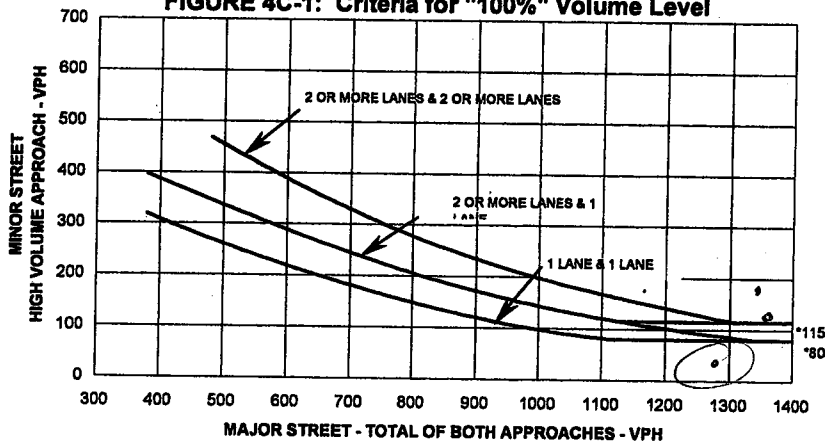
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

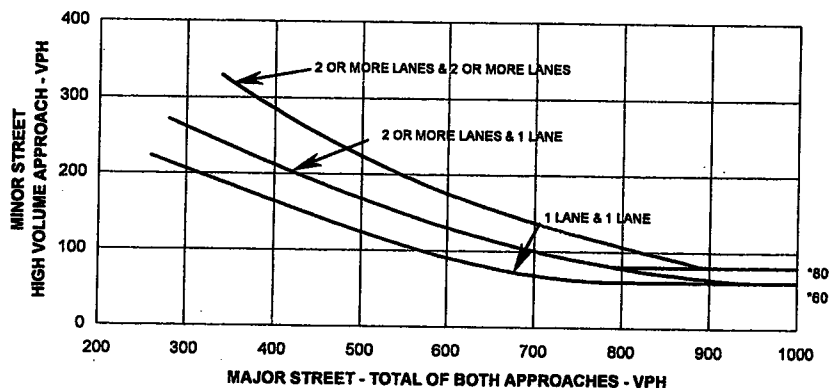
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1273	18
1506	1367	119
1600	1556	149
1700	1341	181

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A.Siu  
Date: 11/17/08

Major Street: Purchase  
Minor Street: Fire Station / Garage

Lanes: 3 Critical Approach Speed: 30  
Lanes: \_\_\_\_\_

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
<u>1600</u>	<u>1556</u>	<u>1497</u>

#### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

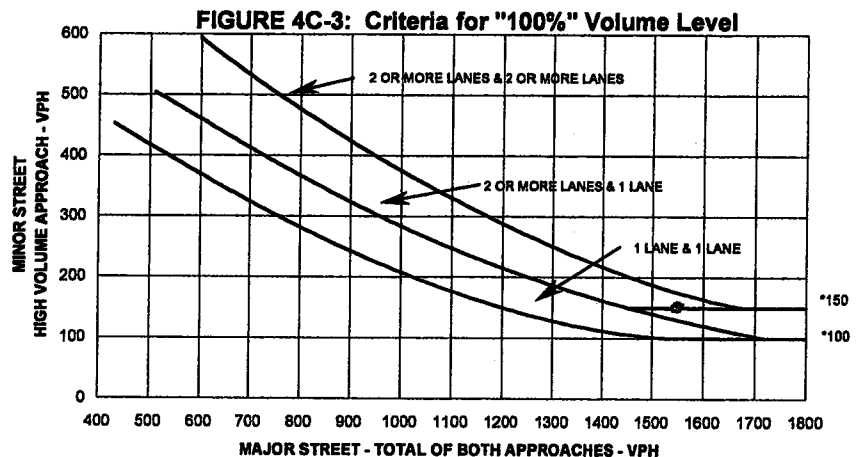
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	<u>149</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

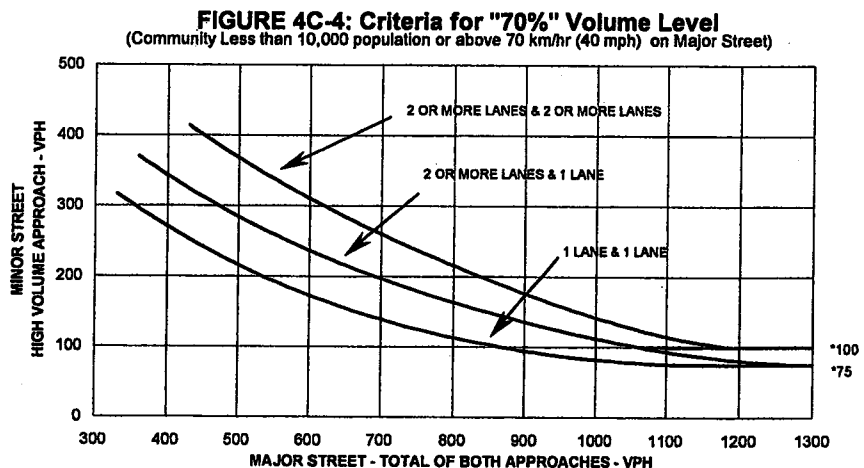
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	<u>1699</u>	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sullivan  
County: Suffolk Date: 11/17/08  
Major Street: Purchase Lanes: 3 Critical Approach Speed: 30  
Minor Street: Fire Station / Gavage Lanes:     

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		0			X
		0			
		6			
		0			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students: <u>    </u>	Hour: <u>    </u>
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes: <u>    </u>	Gaps: <u>    </u>
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3 Critical Approach Speed: 30  
Lanes: \_\_\_\_\_

75

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chronley  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: State St. Lanes: 3

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	990	1282	1183	858	883	983	1034	1262
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	485	636	467	461	499	470	491	512

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	990	1282	1183	858	883	983	1034	1262
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	485	636	467	461	499	470	491	512

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chrenby  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: State St. Lanes: 3

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

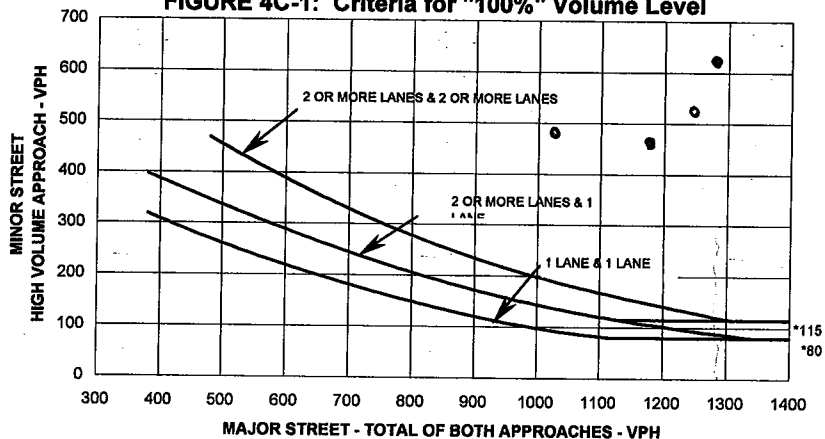
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

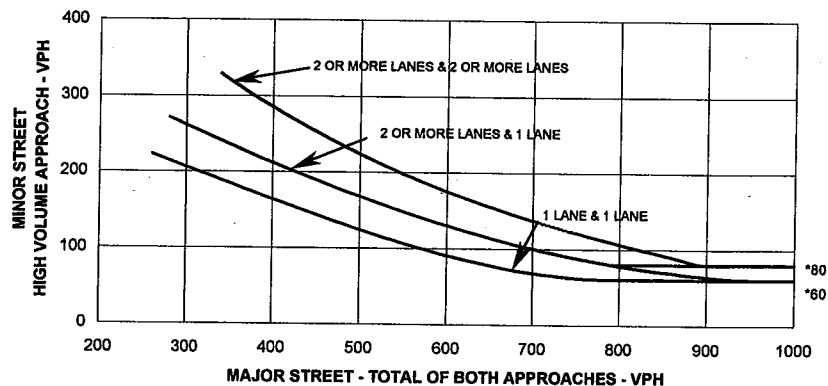
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	1782	636
9 <sup>00</sup>	1183	467
16 <sup>00</sup>	1034	491
17 <sup>00</sup>	1262	512

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chronley  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: State St. Lanes: 3

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
855	1282	636

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

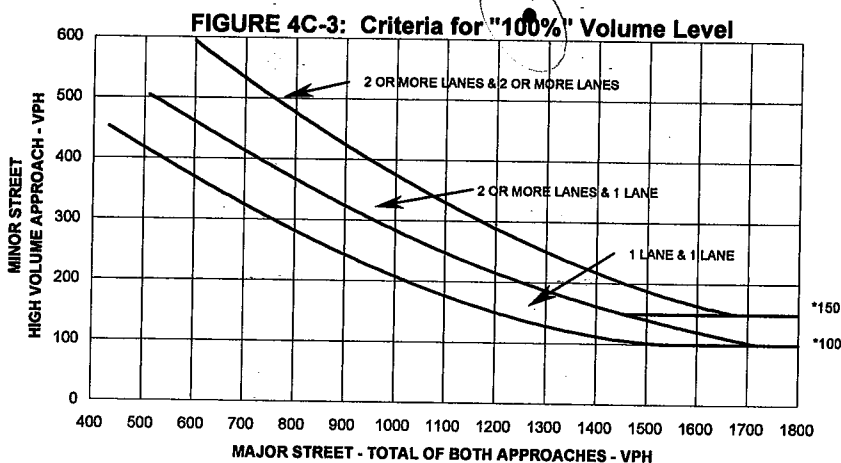
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		636
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

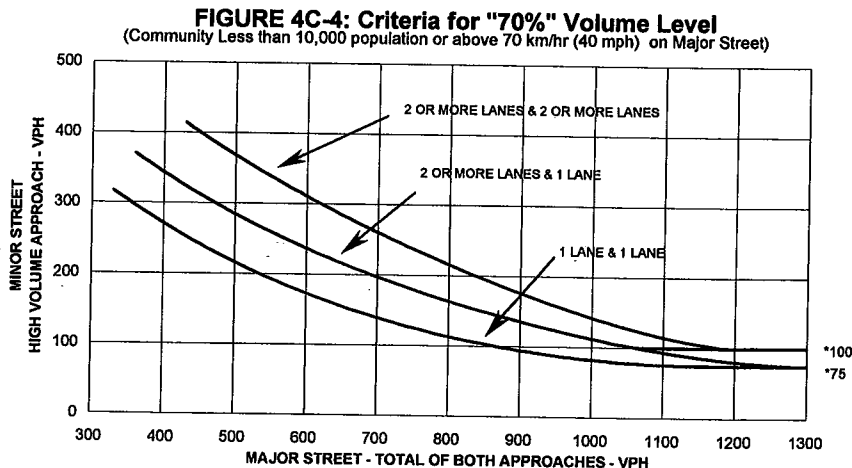
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1918	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: K. Chrenley  
Date: 4/6/09

Major Street: Congress St.  
Minor Street: State St.

Lanes: 3 Critical Approach Speed: \_\_\_\_\_  
Lanes: 3

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8:00	1798			
	13:00	1960			
	16:00	1864			
	17:00	3183			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students: _____	Hour: _____
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes: _____	Gaps: _____
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chrenley  
 County: Suffolk Date: 4/6/09  
 Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
 Minor Street: State St. Lanes: 3

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☒ Yes ☐ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)			X		X	
	Warrant 1, Condition B (80% satisfied)			X			
	Warrant 4, Pedestrian Volume at 80% of volume requirements:			X			
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour						
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		5	X	

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☒ Yes ☐ No

Criteria					Met?		Fulfilled?	
					Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.			Entering Volume:	X		X	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.			Warrant: 1 2 3 Satisfied?: Y Y Y				
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		NO DATA			← Hour			
					← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:	X		X	
	Minor Street:	X			
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:	X			
	Minor Street:	X			
3. Appears as a major route on an official plan.	Major Street:	X			
	Minor Street:	X			

### CONCLUSIONS

Warrants Satisfied:

Remarks: \_\_\_\_\_

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chronley  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: North St. Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	629	847	873	758	882	913	998	1104
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	812	1035	1012	588	544	482	536	527

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	629	847	873	758	882	913	998	1104
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	812	1035	1012	588	544	482	536	527

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: K. Chronley  
Date: 4/6/09

Major Street: Congress St.  
Minor Street: North St.

Lanes: 3  
Lanes: 2

Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

☐ 70% ☒ 100%

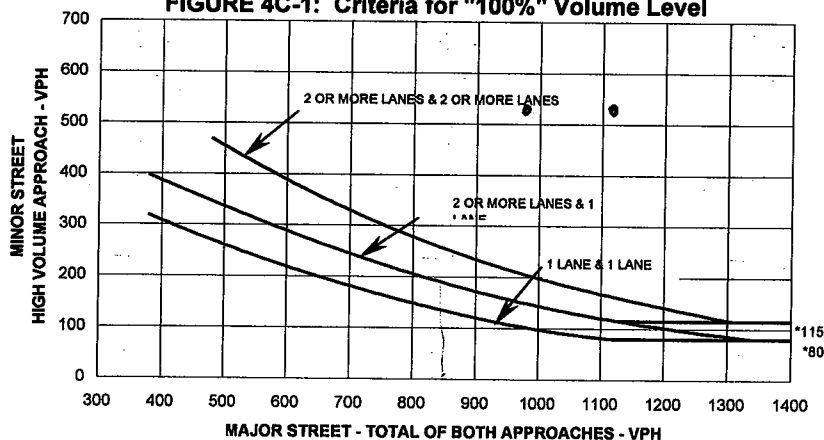
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

FIGURE 4C-1: Criteria for "100%" Volume Level

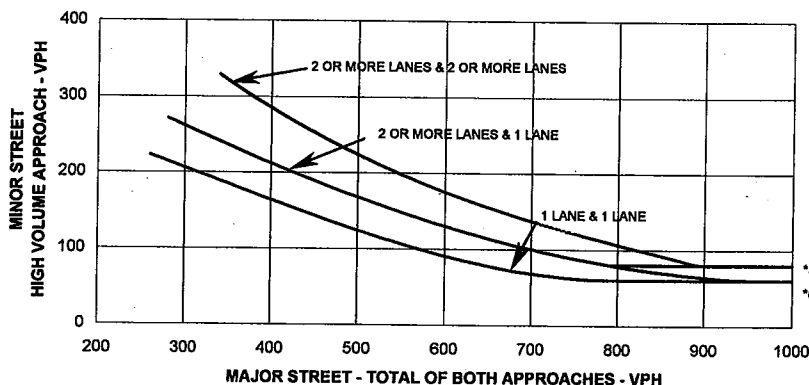


\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	847	1035
9 <sup>00</sup>	873	1012
16 <sup>00</sup>	998	536
17 <sup>00</sup>	1104	527

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Congress St.  
Minor Street: North St.

Engineer: K. Chrenley  
Date: 4/6/09  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
900	873	1012

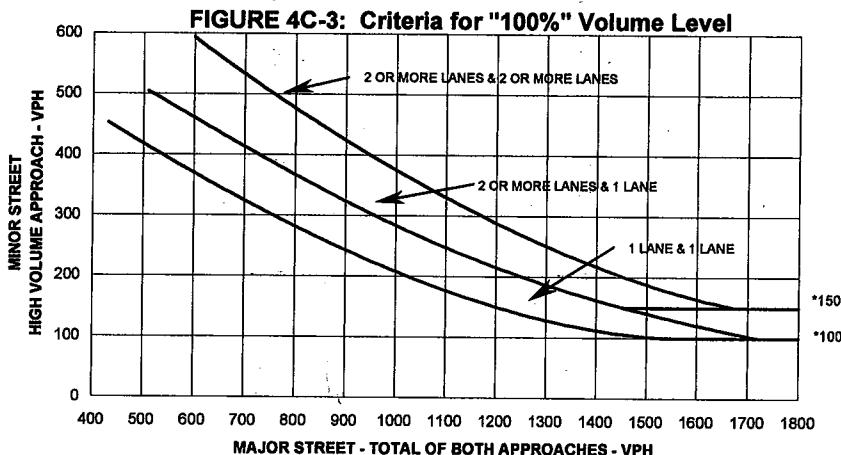
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

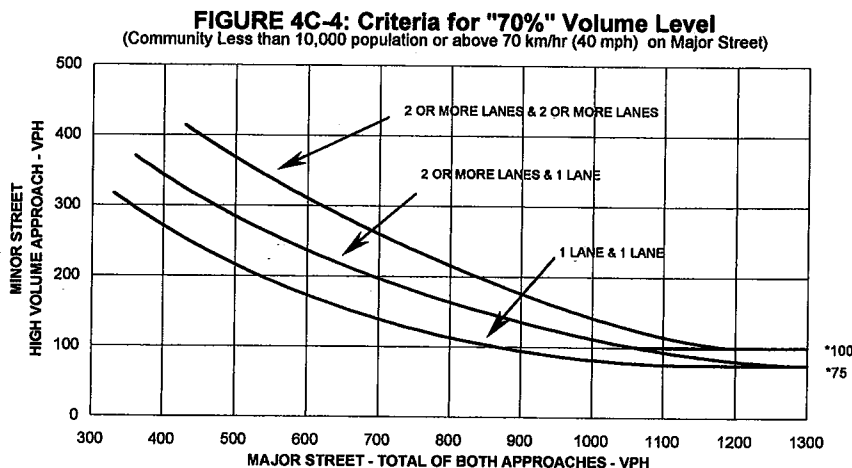
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		1012
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1872	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. O'Brien  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: North St. Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	294			
	12 <sup>00</sup>	296			
	15 <sup>00</sup>	548			
	17 <sup>00</sup>	1150			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chrenley  
County: Suffolk Date: 4/6/09  
Major Street: North St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Union St. Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420								
Highest Approach on Minor Street	150 (120)	105	200 (160)	140								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☐ Yes ☒ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630								
Highest Approach on Minor Street	75 (60)	53	100 (80)	70								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☒

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☒

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chronley  
County: Suffolk Date: 4/6/09  
Major Street: North St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Union St. Lanes:     

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

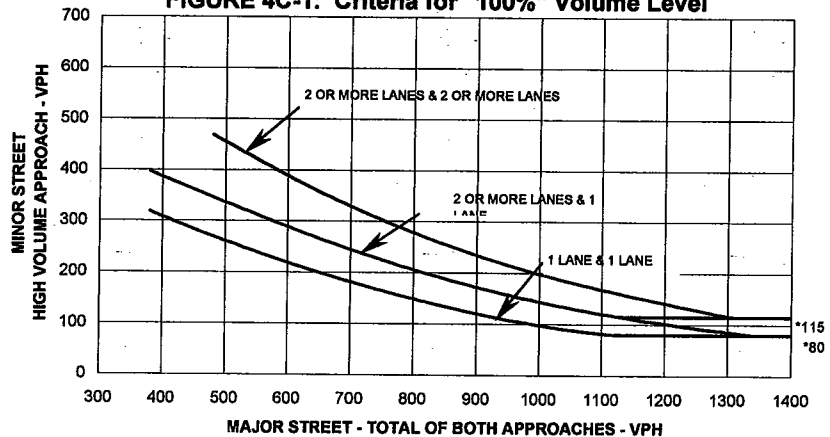
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Plot four volume combinations on the applicable figure below.

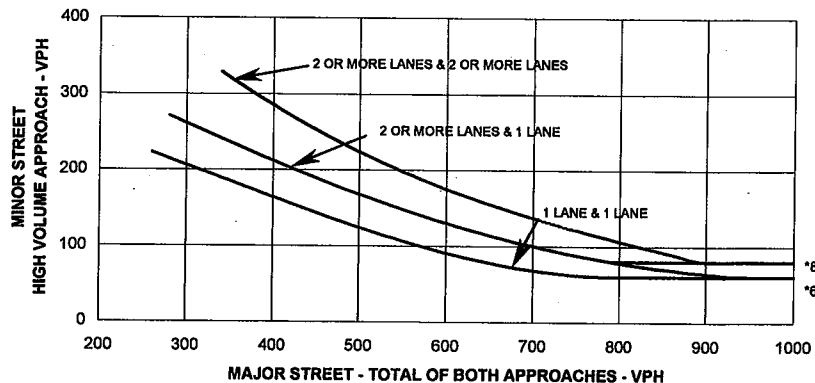
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston, MA Engineer: K. Chronley  
County: Suffolk Date: 4/16/09  
Major Street: North St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Union St. Lanes:     

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Unusual condition justifying use of warrant:

\_\_\_\_\_

\_\_\_\_\_

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		

#### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

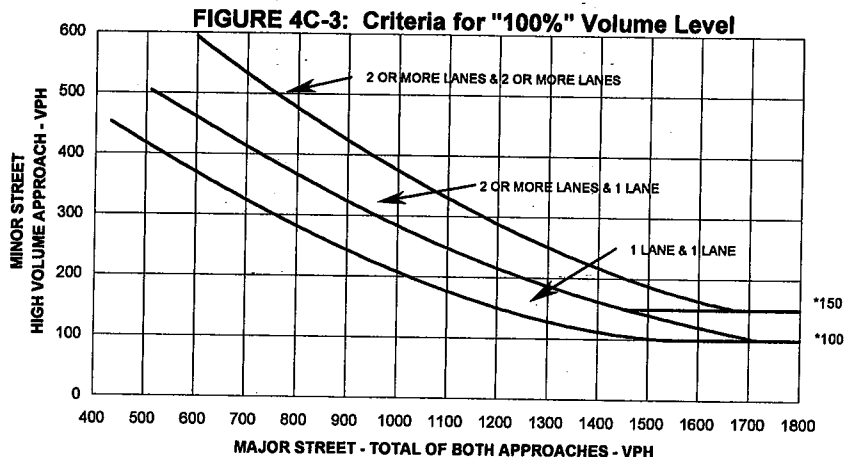
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

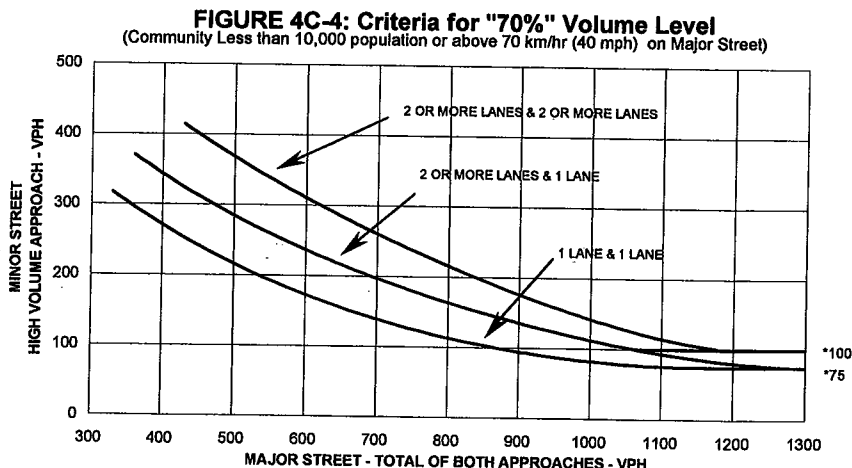
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chrenley  
County: Suffolk Date: 4/6/09  
Major Street: North St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Union St. Lanes:     

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	1700	744			
	1300	761			
	1600	834			
	1700	889			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria		Fulfilled?	
		Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.			
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.			



Lanes: 2 Critical Approach Speed: 30  
Lanes: 0

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chronley  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: O'Hara St. Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	800	900	1000	1100	1200	1300	1400	1500
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	705	753	514	539	548	541	595	650
					246	211	152	183	165	167	158	161

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	800	900	1000	1100	1200	1300	1400	1500
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	705	753	514	539	548	541	595	650
					246	211	152	183	165	167	158	161

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chrenley  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: Haver St. Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

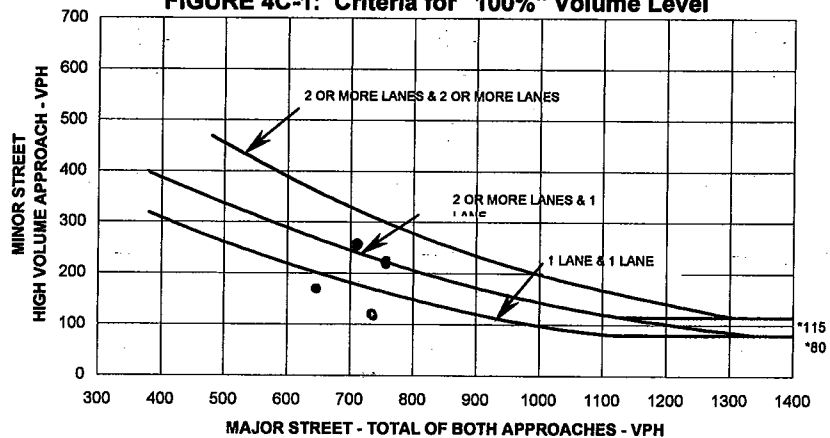
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

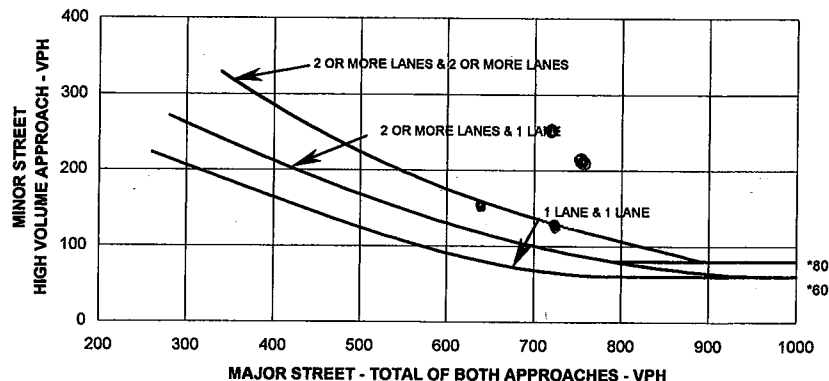
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	705	246
9 <sup>00</sup>	753	211
15 <sup>00</sup>	650	161
17 <sup>00</sup>	738	116

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: K. Chronley  
Date: 4/6/09

Major Street: Congress St.  
Minor Street: O'Hara St.

Lanes: 3 Critical Approach Speed: 30  
Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
9 <sup>00</sup>	753	211

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*	4.1	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

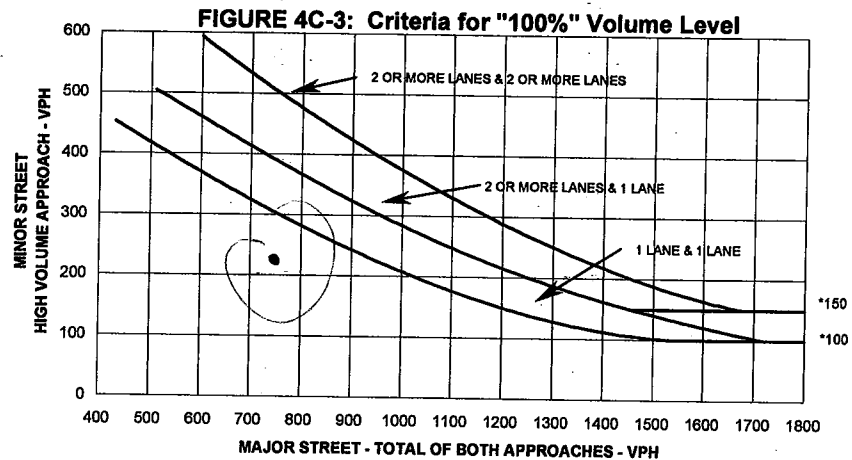
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	211	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

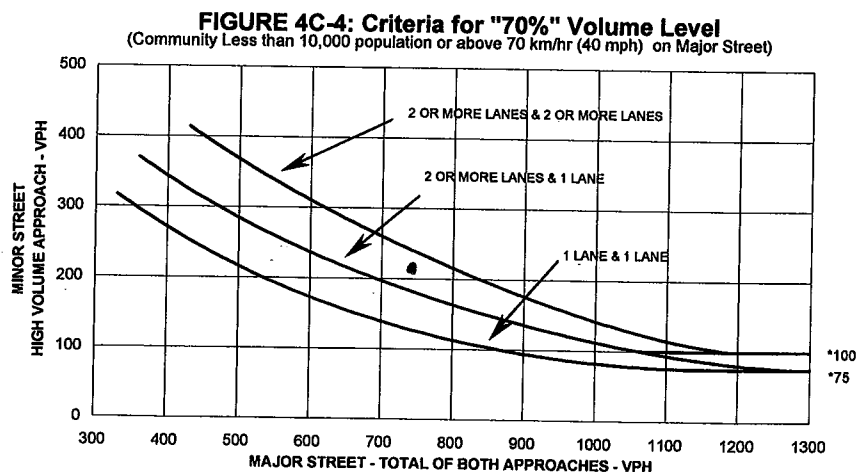
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	964	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: K. Chronley  
Date: 4/16/09

Major Street: Congress St.  
Minor Street: Hancock St.

Lanes: 3 Critical Approach Speed: 30  
Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	614			
	15 <sup>00</sup>	443			
	16 <sup>00</sup>	627			
	17 <sup>00</sup>	719			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria		Fulfilled?	
		Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.			
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.			

Lanes: 3 Critical Approach Speed: 30  
Lanes: 1

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)			X		X	
	Warrant 1, Condition B (80% satisfied)			X			
	Warrant 4, Pedestrian Volume at 80% of volume requirements: 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour		X				
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		0		X

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria							Met?		Fulfilled?	
							Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.			Entering Volume:				X		X
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.			Warrant:						
				Satisfied?:						
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)							← Hour			
							← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:	X			
	Minor Street:		X		
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:	X			
	Minor Street:		X		
3. Appears as a major route on an official plan.	Major Street:	X			
	Minor Street:		X		

Warrants Satisfied: 

--	--	--	--	--	--	--	--

Remarks: \_\_\_\_\_

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chronley  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: Newbury St. Lanes: 4

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.

Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1458	1399	1041	1041	1073	1128	1200	1306
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	510	526	595	555	637	703	755	887

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1458	1399	1041	1041	1073	1128	1200	1306
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	510	526	595	555	637	703	755	887

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chronley  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: New Sudbury St. Lanes: 4

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

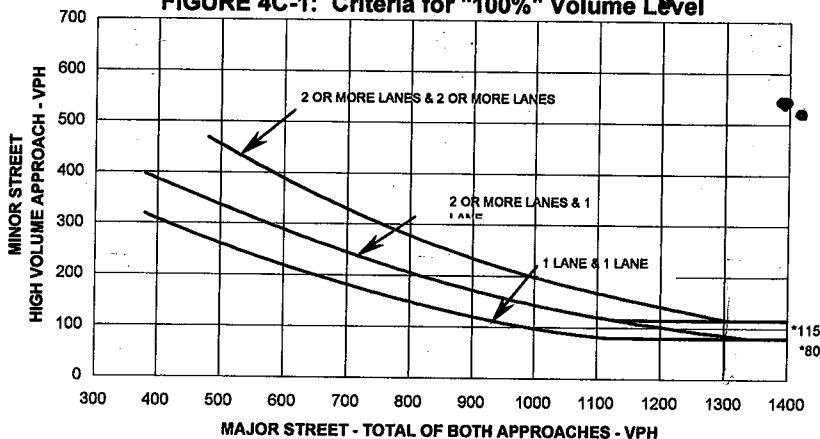
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

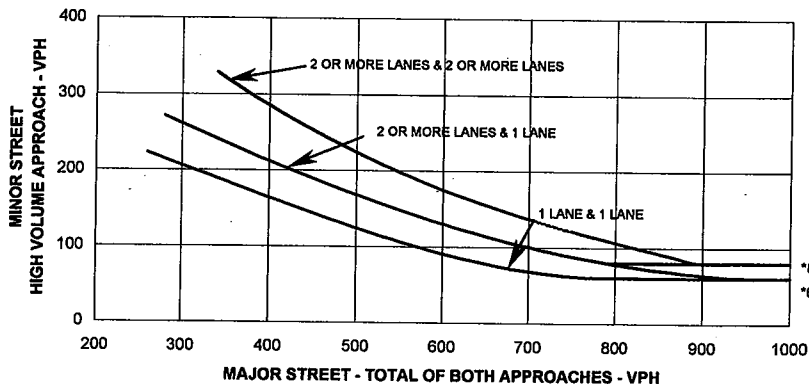
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	1458	510
9 <sup>00</sup>	1394	526
16 <sup>00</sup>	1200	755
17 <sup>00</sup>	1366	887



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chenley  
County: Suffolk Date: 4/6/89  
Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: New Sudbury St. Lanes: 4

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1100	1306	881

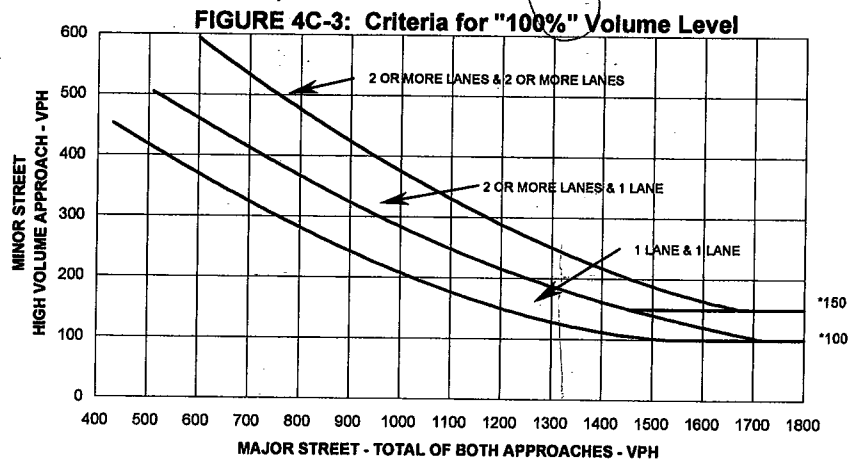
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

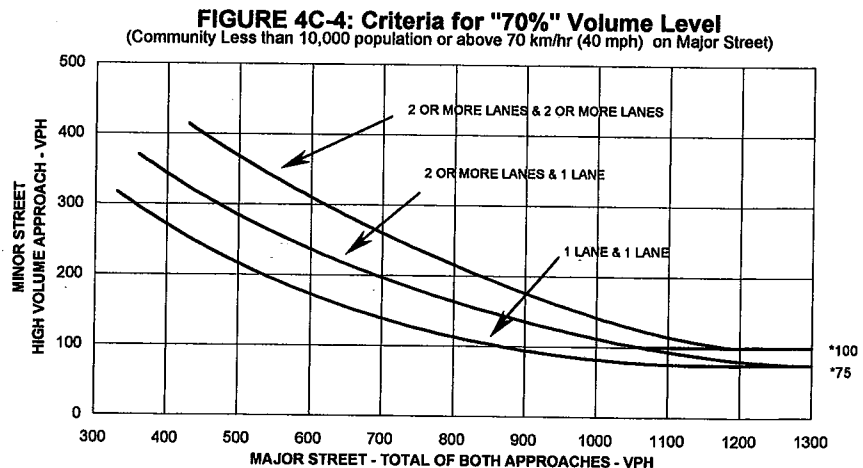
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		881
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	2493	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Congress St.  
Minor Street: New Sudbury St.

Engineer: K. Chronley  
Date: 4/6/09  
Lanes: 3 Critical Approach Speed: 30  
Lanes: 4

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7 <sup>00</sup>	297			
	8 <sup>00</sup>	333			
	16 <sup>00</sup>	335			
	17 <sup>00</sup>	321			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria		Fulfilled?	
		Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.			
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.			

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Connelly  
 County: Suffolk Date: 4/6/09  
 Major Street: Congress St. Lanes: 3 Critical Approach Speed: 30  
 Minor Street: Newbury St Lanes: 4

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)			X			
	Warrant 1, Condition B (80% satisfied)			X			
	Warrant 4, Pedestrian Volume at 80% of volume requirements:						
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour			X		X	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months: <u>3</u>				X

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☐ Yes ☒ No

Criteria					Met?		Fulfilled?	
					Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume: <u>7193</u>		X		X	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant:	1	2	3		
		Satisfied?:		Y	Y	Y		
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		NO DATA		← Hour				
				← Volume				

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:	X			
	Minor Street:		X		
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:	X			
	Minor Street:		X		
3. Appears as a major route on an official plan.	Major Street:	X			
	Minor Street:		X		

### CONCLUSIONS

Warrants Satisfied:

Remarks: \_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: K. Chronley  
Date: 4/6/09

Major Street: Congress St / Herring St.  
Minor Street: New Chardon St.

Lanes: 3 Critical Approach Speed: 30  
Lanes: 3

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1337	1332	1059	1087	1218	1431	1401	1390
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	709	655	451	405	409	401	474	498

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1337	1332	1059	1087	1218	1431	1401	1390
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	709	655	451	405	409	401	474	498

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: K. Chronley  
Date: 4/6/09  
Major Street: Congress St / Merrimac St.  
Minor Street: New Chardon St.  
Lanes: 3  
Lanes: 3  
Critical Approach Speed: 30

### Volume Level Criteria

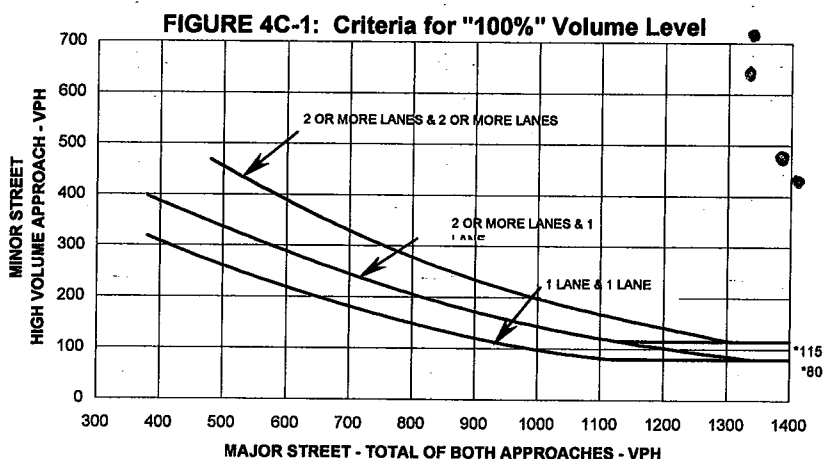
1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

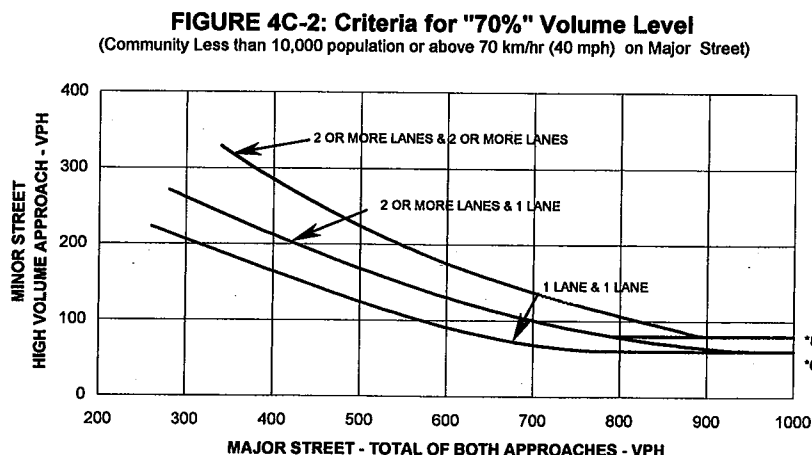
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	1337	709
9 <sup>00</sup>	1332	655
16 <sup>00</sup>	1461	424
17 <sup>00</sup>	1390	498

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chrenley  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. / Merimac St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: New Chardon St. Lanes: 3

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	1390	498

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

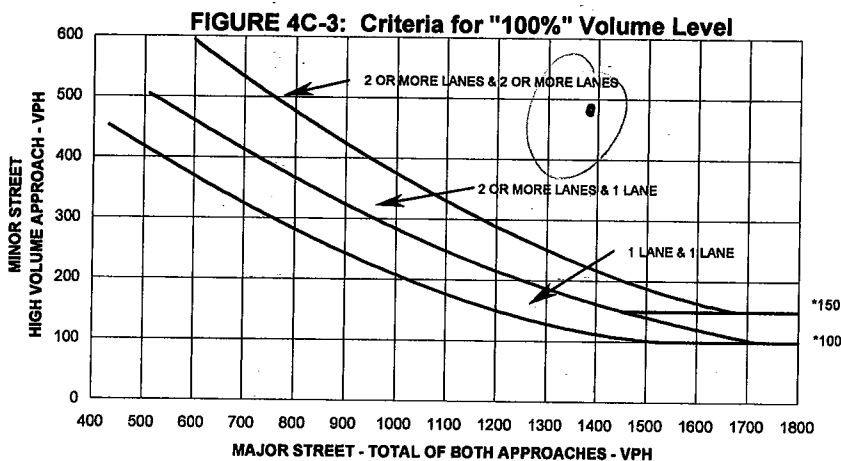
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		498
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

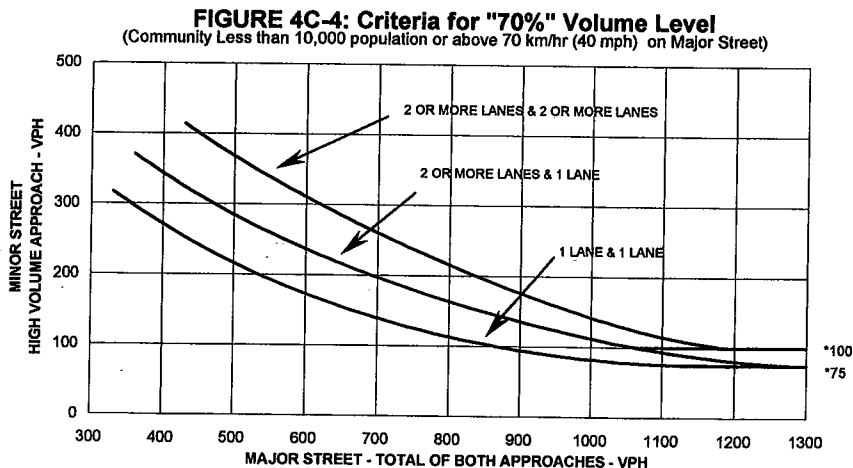
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		2687
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chrenley  
County: Suffolk Date: 4/6/09  
Major Street: Congress St. / Merrimac St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: New Church St. Lanes: 3

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	170			
	17 <sup>00</sup>	157			
	16 <sup>00</sup>	200			
	17 <sup>00</sup>	216			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: K. Chronley  
County: Suffolk Date: 4/6/09  
Major Street: Congress St / Marmac St Lanes: 3 Critical Approach Speed: 30  
Minor Street: Newl Chardon St. Lanes: 3

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)		X			
	Warrant 1, Condition B (80% satisfied)		X			
	Warrant 4, Pedestrian Volume at 80% of volume requirements:					
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour		X		X	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months: <u>3</u>					X

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume:	<u>2287</u>	X		X	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant:	1 2 3	X		X	
		Satisfied?:	Y Y Y	X		X	
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	<u>NO DATA</u>			← Hour			
				← Volume			

Characteristics of Major Routes			Met?		Fulfilled?	
			Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:		X			
	Minor Street:		X			
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:		X			
	Minor Street:		X			
3. Appears as a major route on an official plan.	Major Street:		X			
	Minor Street:		X			

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_  
\_\_\_\_\_



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 12/7/08

Major Street: Summer St  
Minor Street: Dorchester Ave

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1466	1540	1500	1300	1329	1325	1206	1218
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	358	351	340	357	330	398	441	402

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1466	1540	1500	1300	1329	1325	1206	1218
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	358	351	370	357	330	398	441	402

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 12/9/08

Major Street: Summer St.  
Minor Street: Dorchester Ave

Lanes: 7 Critical Approach Speed: 30  
Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

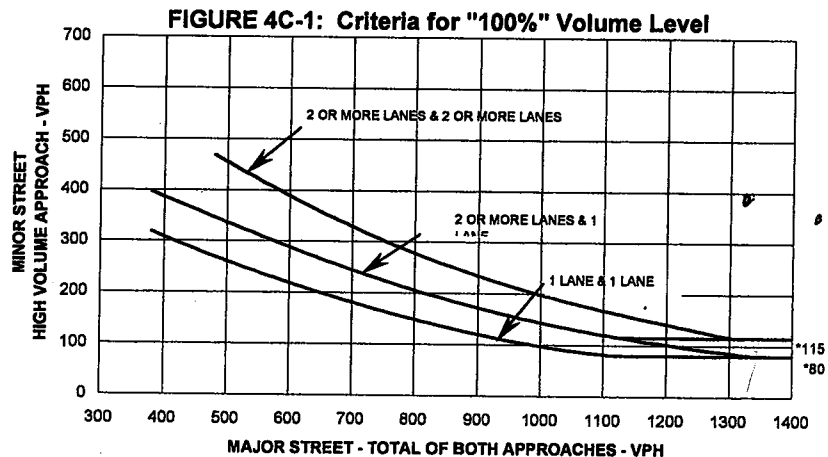
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

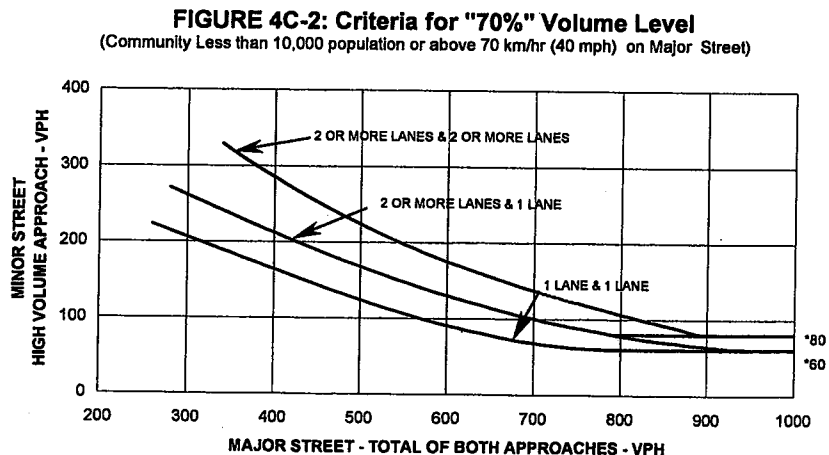
Plot four volume combinations on the applicable figure below.

*\* All points above line*

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1466	358
800	1540	351
900	1500	370
1500	1325	398



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/08  
Major Street: Summer St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Dorchester Ave Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
8 <sup>00</sup>	1540	351

#### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

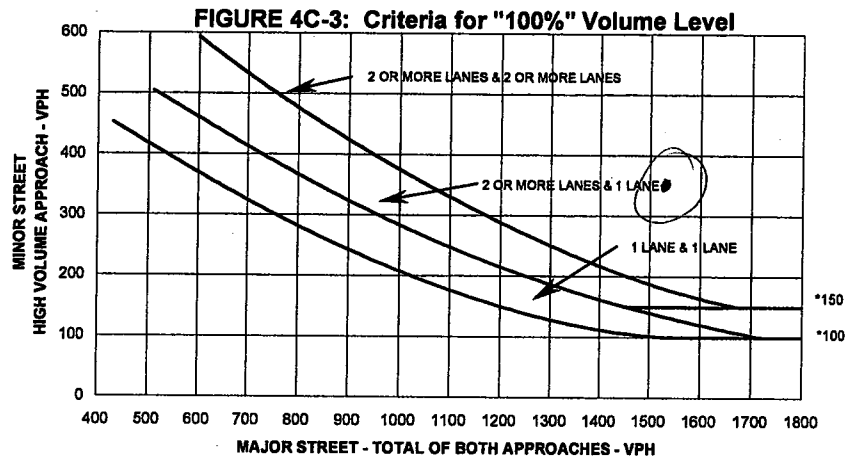
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	351	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

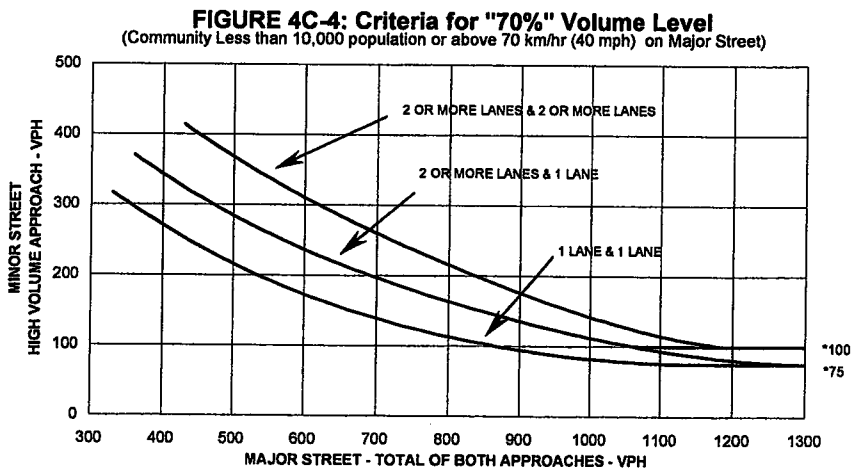
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		1963
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sullivan  
Date: 12/9/08

Major Street: Summer St.  
Minor Street: Dorchester Ave

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*Pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	237			
	9 <sup>00</sup>	123			
	1 <sup>00</sup>	162			
	1 <sup>30</sup>	203			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
Students: _____ Hour: _____		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
Minutes: _____ Gaps: _____		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

*Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.*

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)			X		X	
	Warrant 1, Condition B (80% satisfied)			X			
	Warrant 4, Pedestrian Volume at 80% of volume requirements:						
	80 ped/hr for four (4) hours or			X			
	152 ped/hr for one (1) hour						
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		4		X

**Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.**

Criteria					Met?		Fulfilled?	
					Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.			Entering Volume:		X		X
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant:	1	2	3	X		
		Satisfied?:	Y	Y	Y			
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	NO		DATA		← Hour			
					← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:	✓			X
	Minor Street:		X		
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:	X			
	Minor Street:		X		
3. Appears as a major route on an official plan.	Major Street:	X			
	Minor Street:		✓		

Warrants Satisfied: 

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Remarks: \_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sim  
County: Suffolk Date: 12/1/08  
Major Street: Summer St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Melcher St. Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1534	1544	1479	1327	1300	1261	1242	1167
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	154	141	144	156	147	237	210	262

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☒ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1534	1544	1479	1327	1300	1261	1242	1167
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	154	141	144	156	147	237	210	262

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 12/9/08

Major Street: Summer St.  
Minor Street: Melcher St.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

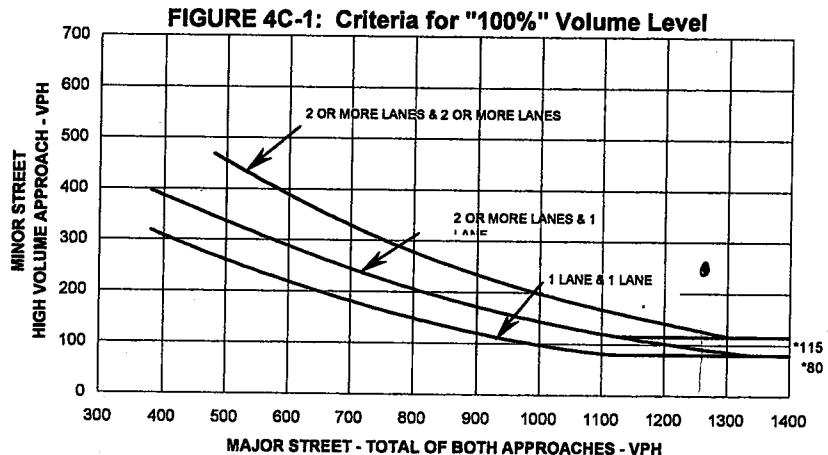
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

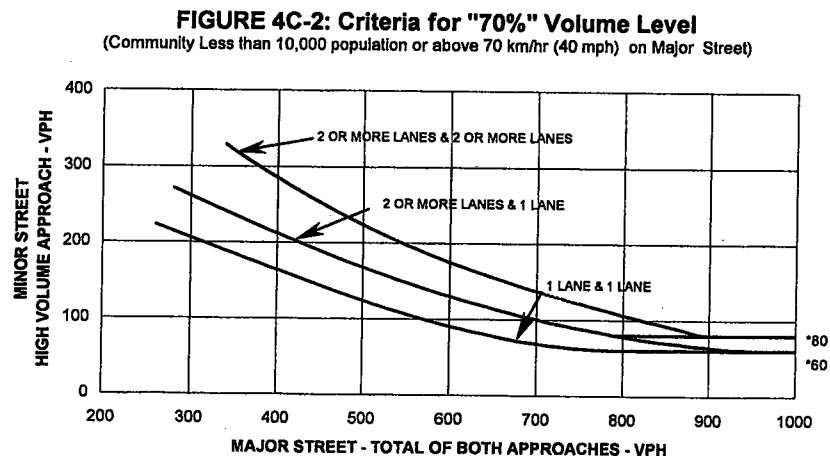
Plot four volume combinations on the applicable figure below.

\* All points  
above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1534	154
800	1544	141
900	1479	144
1500	1261	237



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/08  
Major Street: Summer St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Melcher St. Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour	
7:00	15:34

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

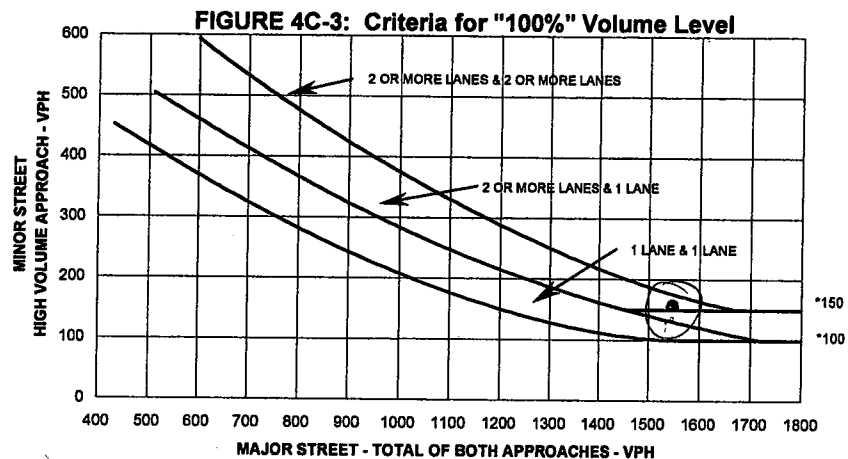
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

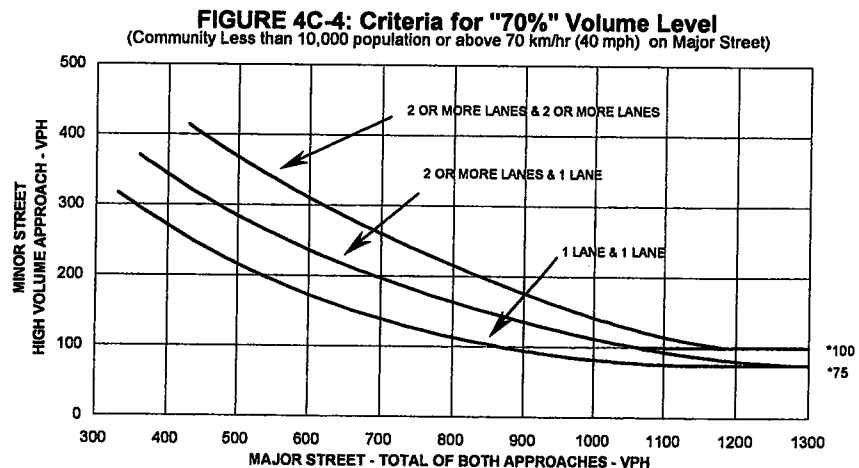
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/9/08

Major Street: Summer St.  
Minor Street: Melcher St.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*Pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	322			
	9 <sup>00</sup>	229			
	12 <sup>00</sup>	309			
	17 <sup>00</sup>	186			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students: <input type="text"/>	Hour: <input type="text"/>
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes: <input type="text"/>	Gaps: <input type="text"/>
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/00  
Major Street: Summer St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Melcher St. Lanes: 1

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)		X			
	Warrant 1, Condition B (80% satisfied)		X			
	Warrant 4, Pedestrian Volume at 80% of volume requirements: 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour		X		X	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months:			1		X

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria							Met?		Fulfilled?	
							Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.			Entering Volume: 1688			X		X	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.			Warrant:			X			
				Satisfied?:						
			1	2	3					
			Y	Y	Y					
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	NO			DATA			← Hour			
	← Volume									

Characteristics of Major Routes				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:			X			
	Minor Street:				X		
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:			X			
	Minor Street:				X		
3. Appears as a major route on an official plan.	Major Street:			X			
	Minor Street:				X		

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_

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## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/9/08  
Major Street: Summer St.  
Minor Street: Pump House  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1200	1400	1500	1600	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1243	1333	921	926	957	1064	1099	1258
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	107	87	97	95	115	126	160	285

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1200	1400	1500	1600	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1243	1333	921	926	957	1064	1099	1258
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	107	87	97	95	115	126	160	285

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/9/08  
Major Street: Summer St.  
Minor Street: Pump House  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

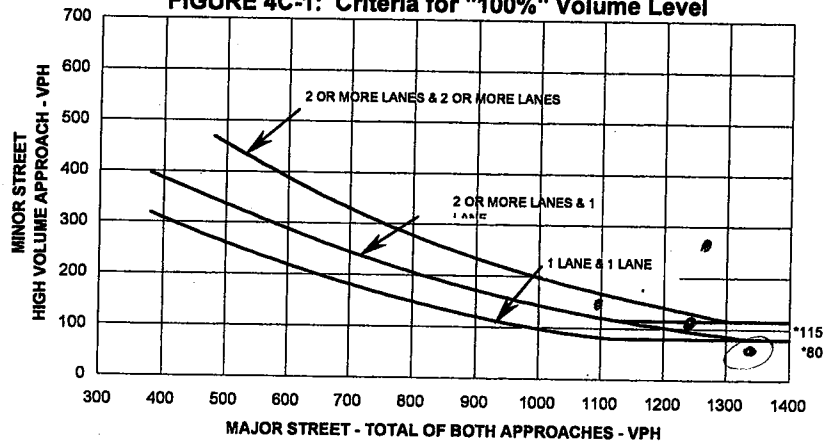
## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

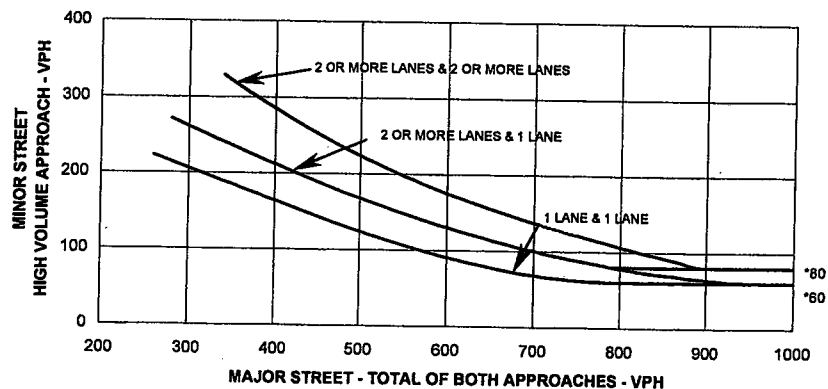
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
7 <sup>00</sup>	1243	107
8 <sup>00</sup>	1333	87
16 <sup>00</sup>	1099	160
17 <sup>00</sup>	1258	285

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/09  
Major Street: Summer St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Pump House Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
1700	1285	285

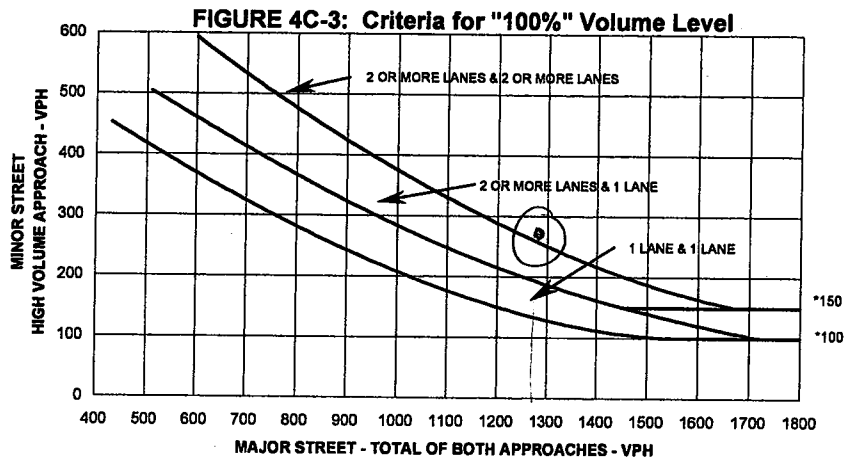
#### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

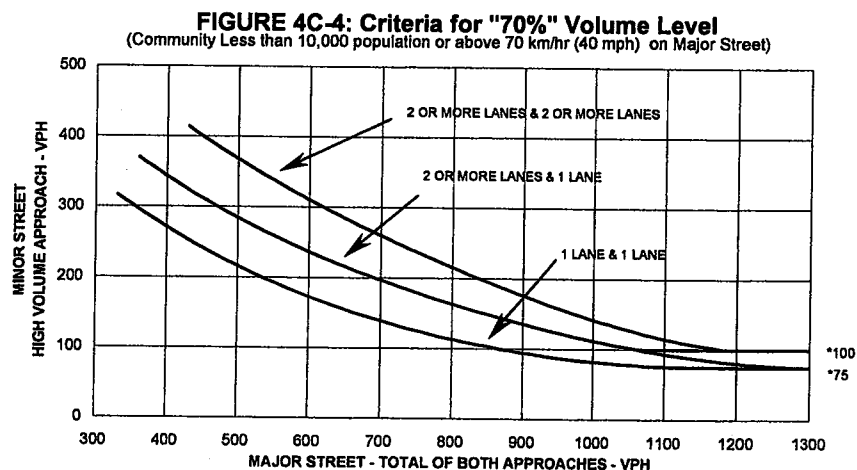
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/9/08

Major Street: Summer St.  
Minor Street: Pump House

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	18			
	11 <sup>00</sup>	13			
	12 <sup>00</sup>	12			
	1 <sup>00</sup>	12			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students: <input type="text"/>	Hour: <input type="text"/>
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes: <input type="text"/>	Gaps: <input type="text"/>
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sim  
Date: 12/9/08  
Major Street: Haul Rd  
Minor Street: Pump House  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	2 or more										
Approach Lanes	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	218	202	206	179	231	246	295	469
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	260	266	138	107	129	153	146	181

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	2 or more										
Approach Lanes	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	218	202	206	179	231	246	295	469
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	260	266	138	107	129	153	146	181

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sin  
County: Suffolk Date: 12/9/08  
Major Street: Haw Rd Lanes: 2 Critical Approach Speed: 30  
Minor Street: Pump House Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

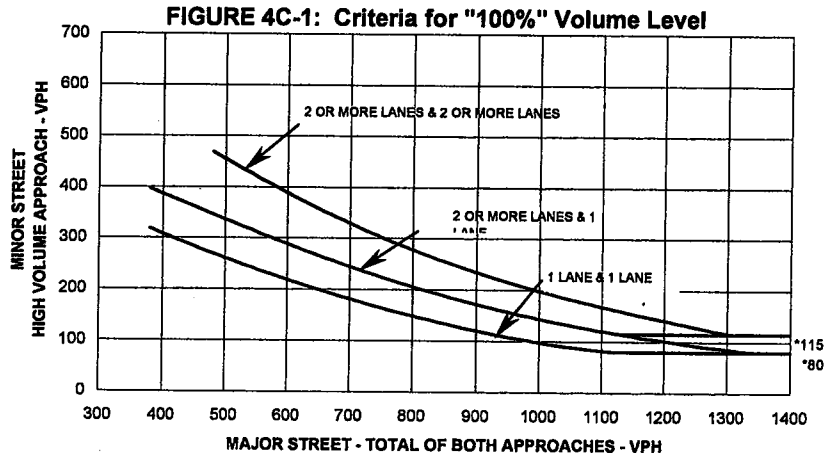
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

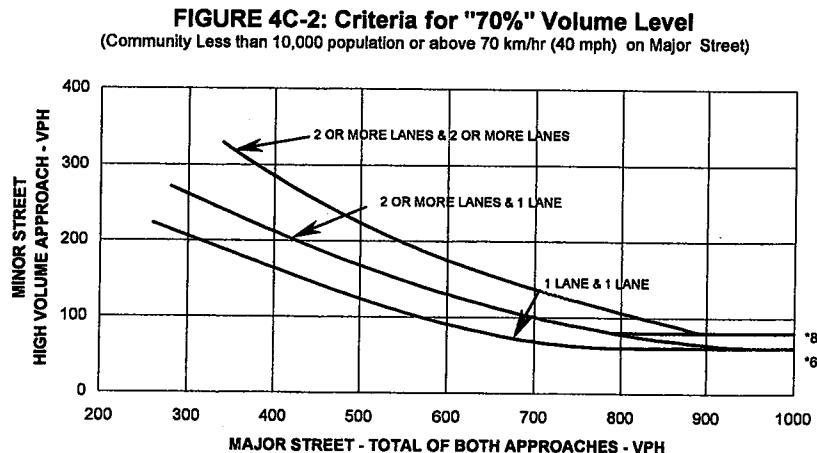
Plot four volume combinations on the applicable figure below.

\* All points  
below line

Four Highest Hours	Volumes	
	Major Street	Minor Street
7 <sup>00</sup>	218	260
8 <sup>00</sup>	202	266
16 <sup>00</sup>	295	146
17 <sup>00</sup>	469	101



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/08  
Major Street: Haul Rd Lanes: 2 Critical Approach Speed: 30  
Minor Street: Pump House Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	469	181

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

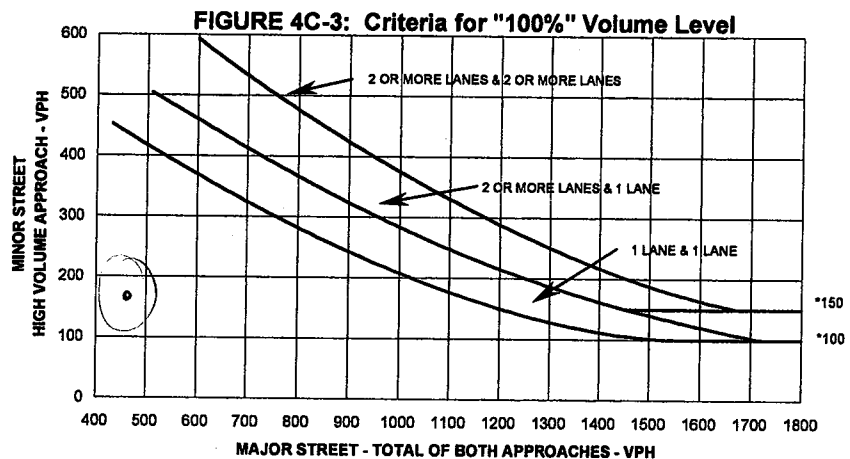
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	181	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

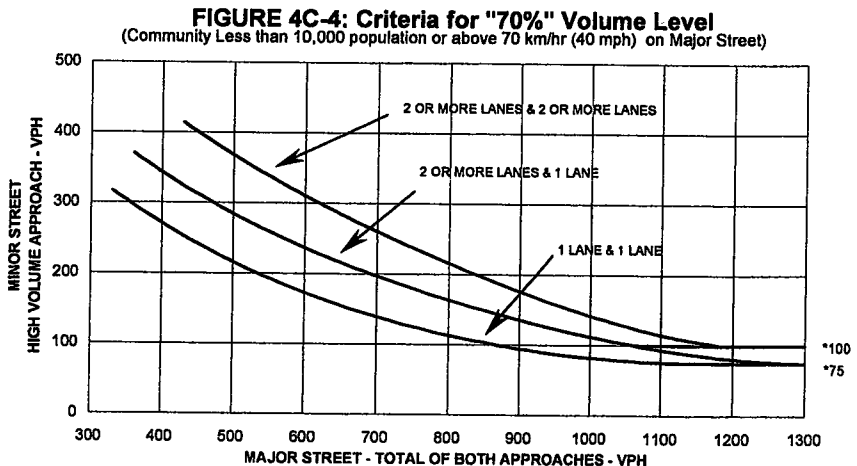
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	650	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/9/08

Major Street: Hull Rd  
Minor Street: Pump House

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7:00	5			
	8:00	15			
	12:00	5			
	1:00	5			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/08  
Major Street: Haul Rd Lanes: 2 Critical Approach Speed: 30  
Minor Street: Pump House Lanes: 1

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour						
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		<u>0</u>		<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria					Met?		Fulfilled?	
					Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume: <u>650</u>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant:	1	2	3		
			Satisfied?:	<u>N</u>	<u>N</u>	<u>N</u>	<input checked="" type="checkbox"/>	
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		<u>NO</u>	<u>DATA</u>		← Hour			
					← Volume			

Characteristics of Major Routes			Met?		Fulfilled?	
			Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:					
	Minor Street:					
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:					
	Minor Street:					
3. Appears as a major route on an official plan.	Major Street:					
	Minor Street:					

### CONCLUSIONS

Warrants Satisfied: 

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Remarks: \_\_\_\_\_  
\_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/08  
Major Street: Summer St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: D Street Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1300	1400	1500	1600	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1005	1178	871	855	846	936	1013	1196
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	430	418	409	310	353	427	451	561

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1300	1400	1500	1600	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1005	1178	871	855	846	936	1013	1196
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	430	418	409	310	353	427	451	561

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Summer St.  
Minor Street: D. Street

Engineer: A. Silva  
Date: 12/9/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

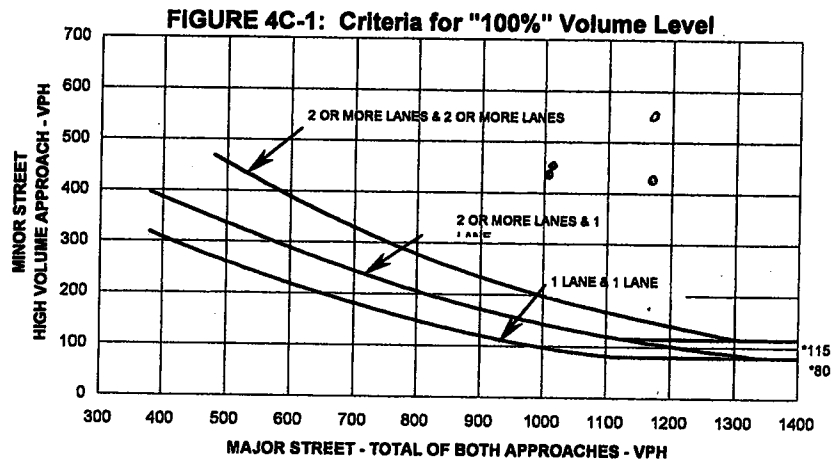
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

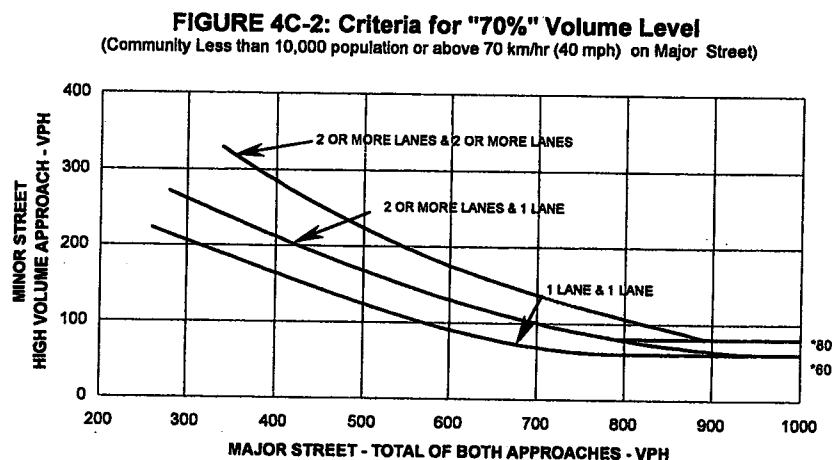
Plot four volume combinations on the applicable figure below.

\* All points  
above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1005	430
800	1170	418
1600	1013	451
1700	1196	561



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Summer St.  
Minor Street: D Street

Engineer: A. Siu  
Date: 12/9/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1300	1196	360

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

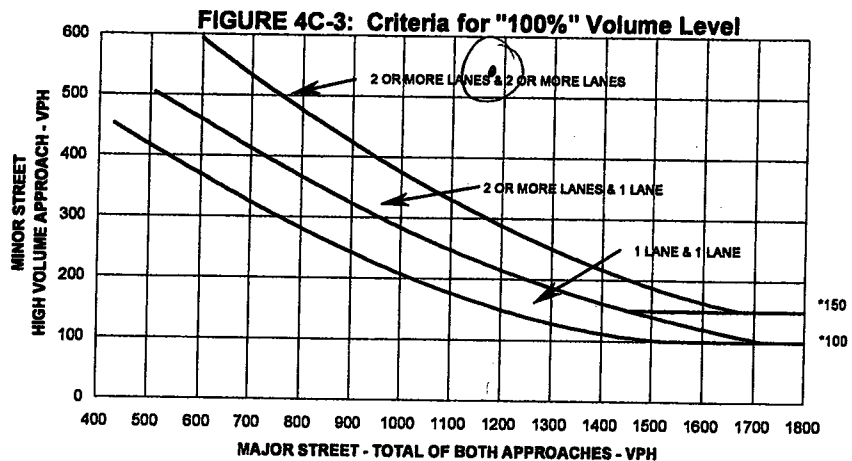
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

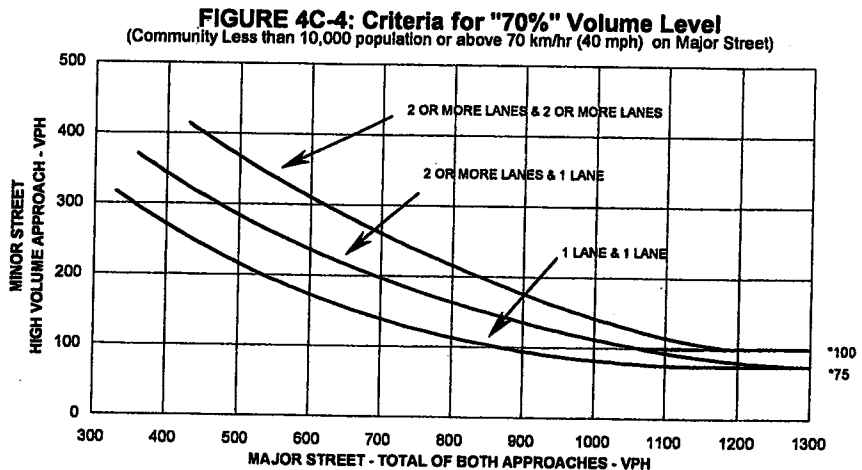
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Summer St.  
Minor Street: D Street

Engineer: A. Sil  
Date: 12/9/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	<u>8:00</u>	<u>55</u>			
	<u>12:00</u>	<u>122</u>			
	<u>13:00</u>	<u>68</u>			
	<u>17:00</u>	<u>49</u>			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				<input checked="" type="checkbox"/>	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		





# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/9/08  
Major Street: D Street  
Minor Street: I-90 Ramp  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420								
Highest Approach on Minor Street	150 (120)	105	200 (160)	140								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☐ Yes ☒ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☐ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more									
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630								
Highest Approach on Minor Street	75 (60)	53	100 (80)	70								

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☒

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☒

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sin  
County: Suffolk Date: 12/9/08  
Major Street: D Street Lanes: 2 Critical Approach Speed: 30  
Minor Street: I-90 Ramp Lanes:   

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

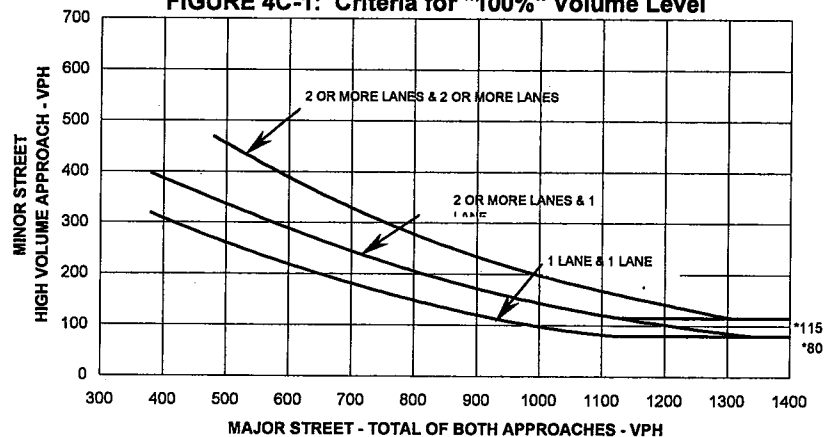
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

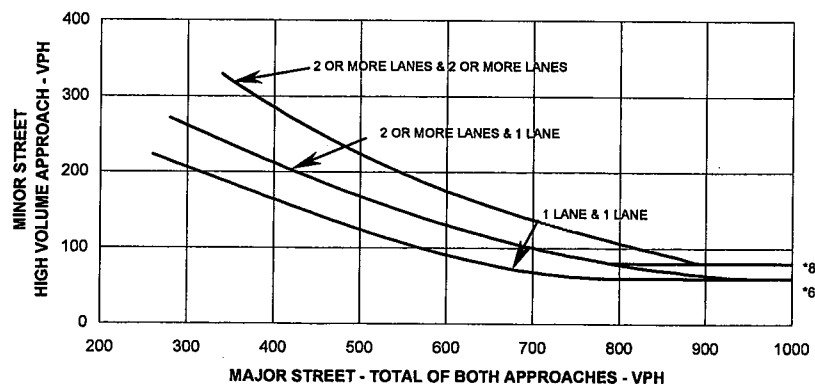
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. SIM  
Date: 12/9/08

Major Street: D Street  
Minor Street: I-90 Ramps

Lanes: 2 Critical Approach Speed: 30  
Lanes:     

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		

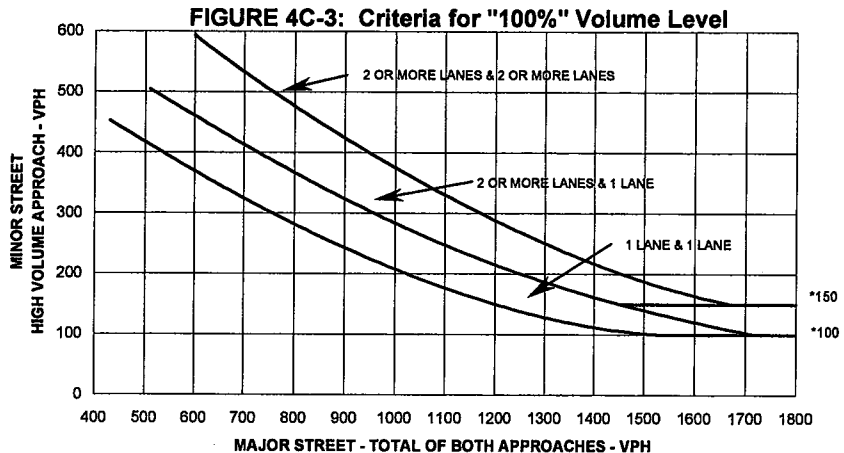
#### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

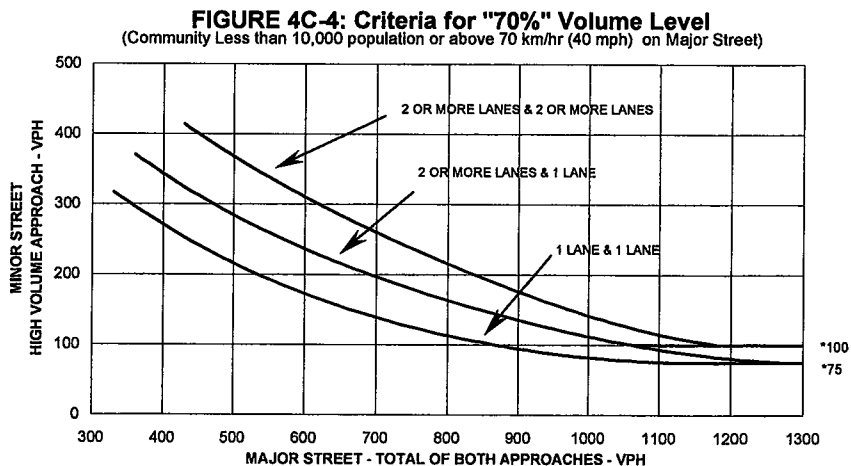
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/08  
Major Street: D Street Lanes: 2 Critical Approach Speed: 30  
Minor Street: I-90 Ramp Lanes:     

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7:00	4			
	8:00	10			
	12:00	5			
	1:00	7			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students: <u>    </u>	Hour: <u>    </u>
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes: <u>    </u>	Gaps: <u>    </u>
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
 County: Suffolk Date: 12/9/08  
 Major Street: D Street Lanes: 2 Critical Approach Speed: 30  
 Minor Street: I-90 Ramp Lanes:     

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☐ Yes ☒ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)			X		
	Warrant 1, Condition B (80% satisfied)			X		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:			X		X
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour					
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months:					X

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☒ No  
 Satisfied: ☐ Yes ☐ No

Criteria						Met?		Fulfilled?	
						Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.			Entering Volume:					
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.			Warrant:	1 2 3				
				Satisfied?:					
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)						← Hour			
						← Volume			

Characteristics of Major Routes						Met?		Fulfilled?	
						Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:								
	Minor Street:								
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:								
	Minor Street:								
3. Appears as a major route on an official plan.	Major Street:								
	Minor Street:								

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_  
 \_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Silva  
Date: 12/9/08  
Major Street: D Street  
Minor Street: Transitway  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1		2 or more									
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	946	1007	792	685	779	914	1044	1405
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	32	30	24	22	13	25	36	37

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1		2 or more									
	Volume Level		100%	70%	100%	70%						
Both Approaches on Major Street	750 (600)	525	900 (720)	630	946	1007	792	685	779	914	1044	1405
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	32	30	24	22	13	25	36	37

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/08  
Major Street: D Street Lanes: 2 Critical Approach Speed: 30  
Minor Street: Transitway Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

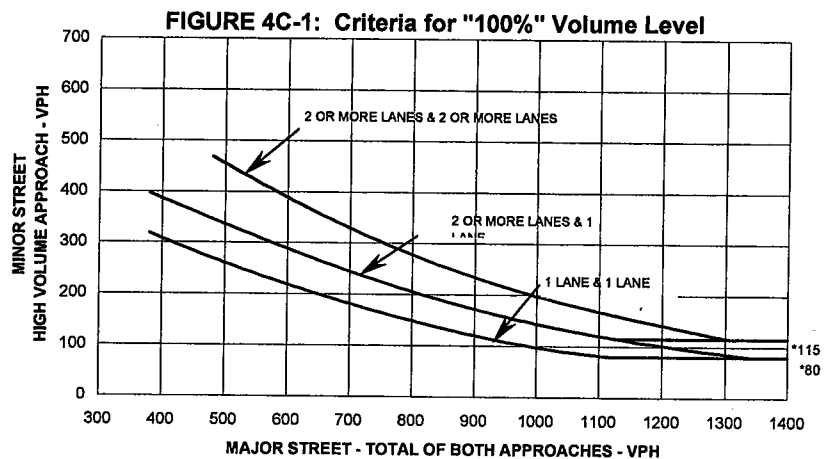
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

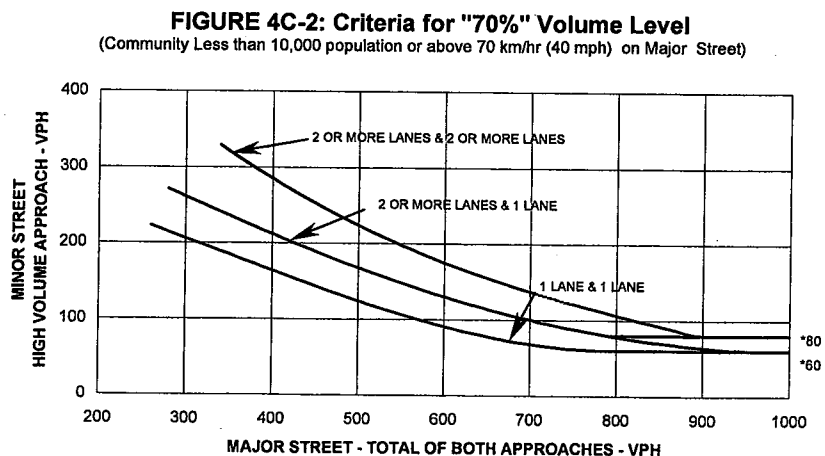
Plot four volume combinations on the applicable figure below.

*All points below line*

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	946	32
800	1007	30
1600	1044	36
1700	1405	37



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A.Siu  
County: Suffolk Date: 12/9/08  
Major Street: D Street Lanes: 2 Critical Approach Speed: 30  
Minor Street: Transitway Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
1700	1405	37

#### Criteria

#### 1. Delay on Minor Approach \*(vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

#### 2. Volume on Minor Approach \*(vehicles per hour)

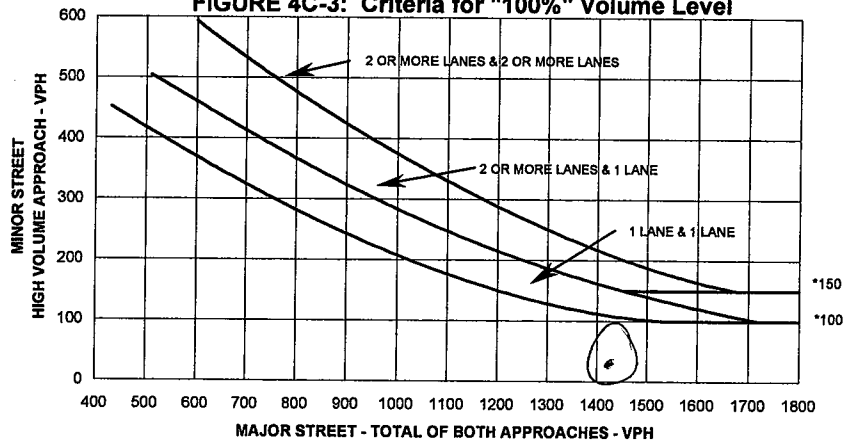
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	37	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

#### 3. Total Entering Volume \*(vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		1471
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

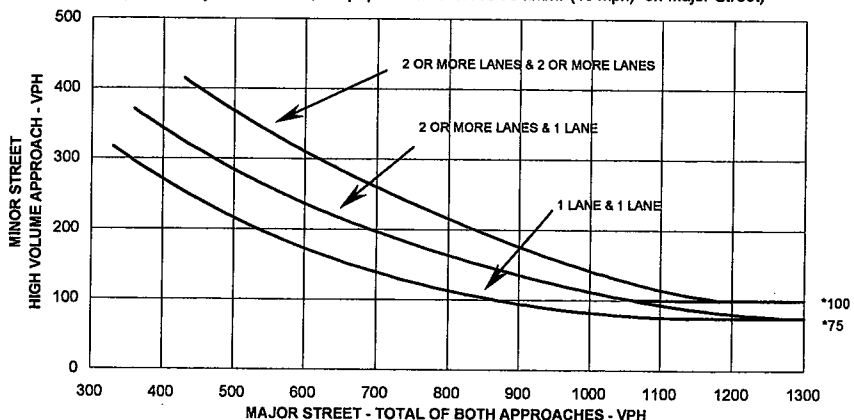
Plot volume combination on the applicable figure below.

FIGURE 4C-3: Criteria for "100%" Volume Level



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-4: Criteria for "70%" Volume Level  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/9/08  
Major Street: D Street  
Minor Street: Transitway  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	12 <sup>00</sup>	8			
	13 <sup>00</sup>	15			
	15 <sup>00</sup>	10			
	17 <sup>00</sup>	7			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/08  
Major Street: Congress St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: D Street Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours								
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>	
	1		2 or more										
Approach Lanes	1		2 or more										
Volume Level	100%	70%	100%	70%									
Both Approaches on Major Street	500 (400)	350	600 (480)	420	732	797	626	439	514	555	633	822	
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	389	460	311	281	307	328	351	536	

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours								
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>	
	Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%									
Both Approaches on Major Street	750 (600)	525	900 (720)	630	732	797	626	439	514	555	633	822	
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	389	460	311	281	307	328	351	530	

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/19/08

Major Street: Congress St  
Minor Street: JD Street

Lanes: 2  
Lanes: 2 Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

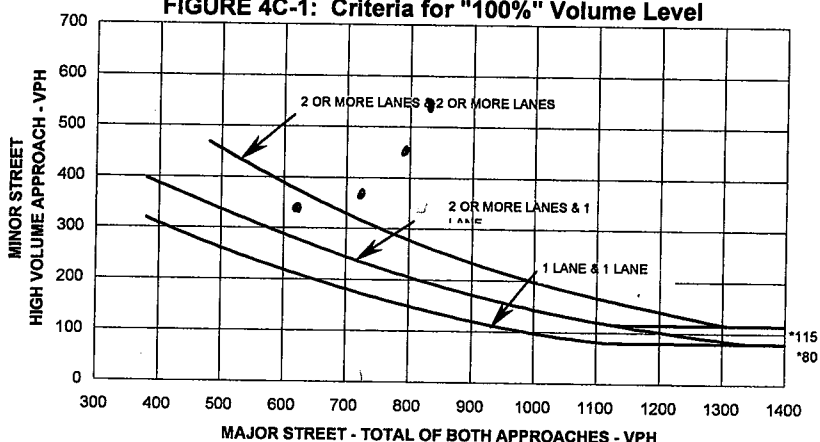
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

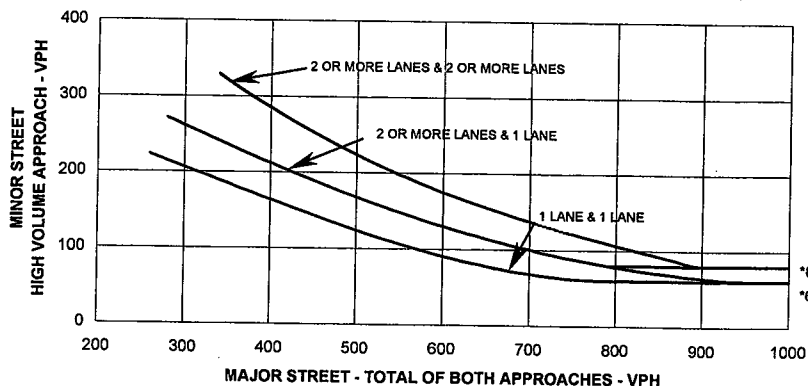
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	732	389
800	797	460
1600	633	351
1700	822	530

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/9/08  
Major Street: Congress St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: D Street Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
1700	822	530

#### Criteria

#### 1. Delay on Minor Approach \*(vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

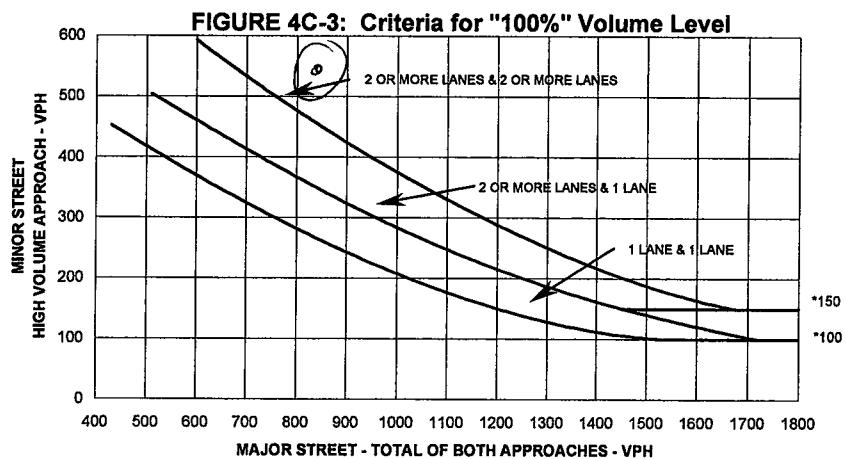
#### 2. Volume on Minor Approach \*(vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		536
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

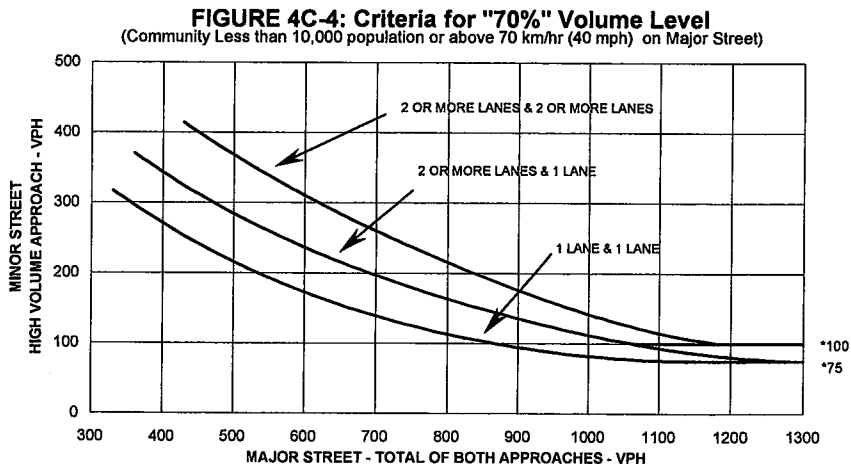
#### 3. Total Entering Volume \*(vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		1918
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sullivan  
County: Suffolk Date: 12/9/08  
Major Street: Congress Street Lanes: 2 Critical Approach Speed: 30  
Minor Street: D J Street Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	71			
	12 <sup>00</sup>	108			
	13 <sup>00</sup>	105			
	17 <sup>00</sup>	55			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/10/08  
Major Street: Congress St.  
Minor Street: I-90 Ramps  
Lanes: 2  
Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours								
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>	
	1		2 or more										
	Volume Level		100%	70%									100%
Both Approaches on Major Street	500 (400)	350	600 (480)	420	907	970	703	507	538	690	922	1242	
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	837	924	590	395	354	438	506	420	

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	1 <sup>00</sup>	2 <sup>00</sup>
	Approach Lanes	1		2 or more								
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	907	970	703	507	538	690	922	1242
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	837	924	590	395	354	438	506	420

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 12/10/08

Major Street: Congress St.  
Minor Street: I-90 Ramps

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

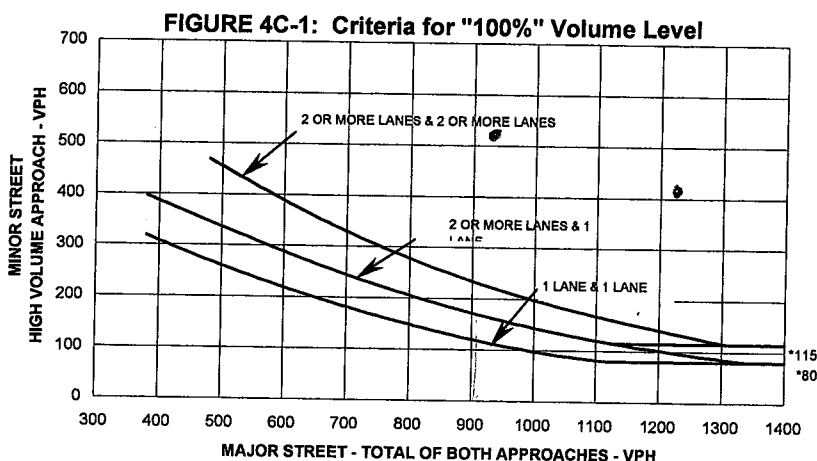
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

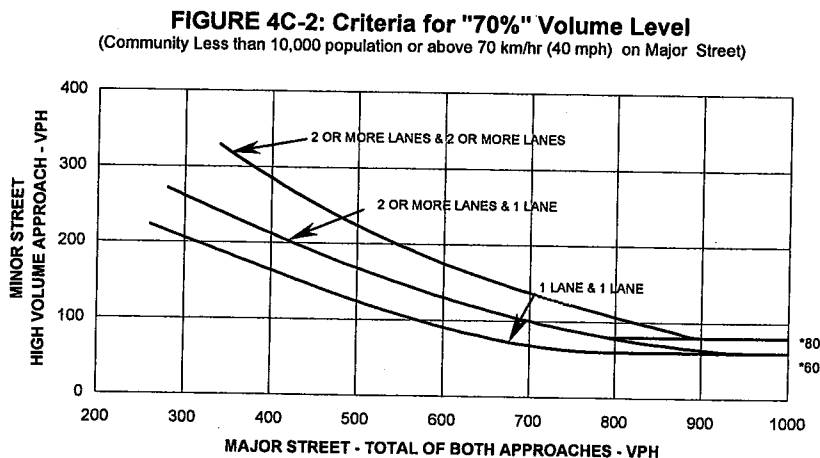
Plot four volume combinations on the applicable figure below.

\*All points  
above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
7 <sup>00</sup>	907	837
8 <sup>00</sup>	970	924
16 <sup>00</sup>	922	506
17 <sup>00</sup>	1242	420



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sullivan  
 County: Suffolk Date: 12/10/08  
 Major Street: Congress St. Lanes: 2 Critical Approach Speed: 30  
 Minor Street: I-90 Ramps Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

\_\_\_\_\_

\_\_\_\_\_

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
7:00	1242	420

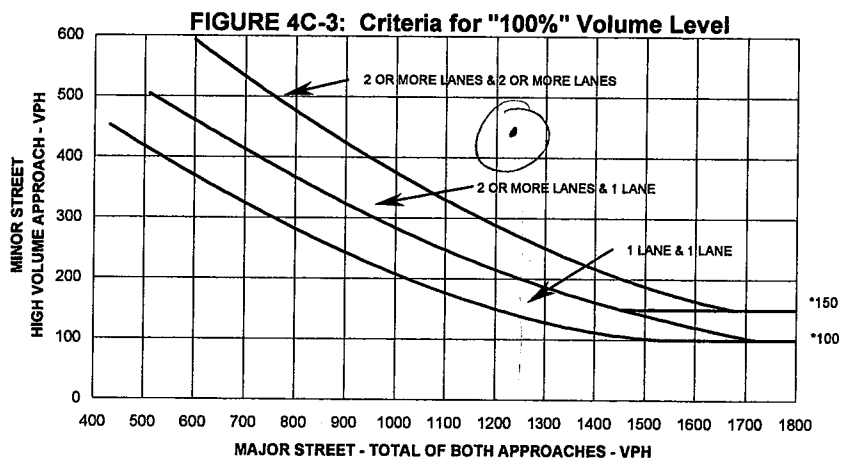
#### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

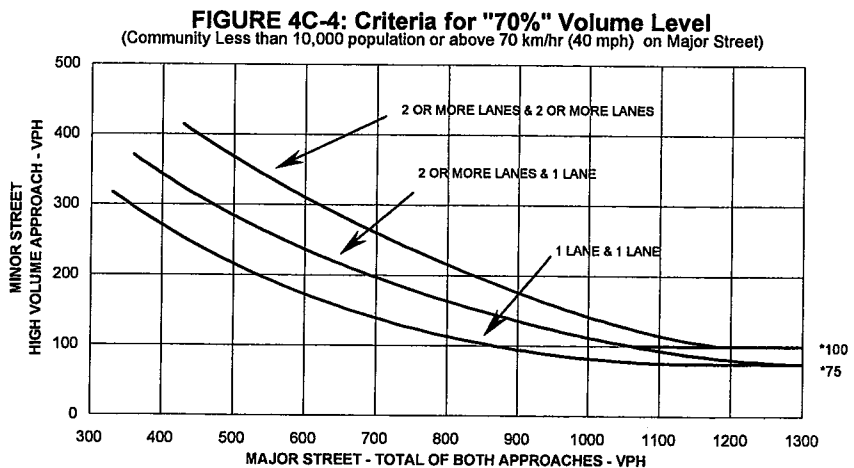
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		420
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		1960
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/10/08

Major Street: Congress St.  
Minor Street: I-90 Ramps

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7 <sup>00</sup>	25			
	8 <sup>00</sup>	43			
	16 <sup>00</sup>	29			
	17 <sup>00</sup>	25			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
 County: Suffolk Date: 12/10/08  
 Major Street: Congress St. Lanes: 2 Critical Approach Speed: 30  
 Minor Street: I-93 Ramp / ESR Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
 2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
 If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
 Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☐ Yes ☒ No

## Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
 80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	458	508	432	317	369	368	497	642
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	650	719	474	171	111	117	162	309

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
 Excessive Delay: ☐ Yes ☐ No  
 100% Satisfied: ☐ Yes ☒ No  
 80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	458	508	432	317	369	368	497	642
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	650	719	474	171	111	117	162	309

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sim  
Date: 12/10/08  
Major Street: Compress St  
Minor Street: I-93 / ESR  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

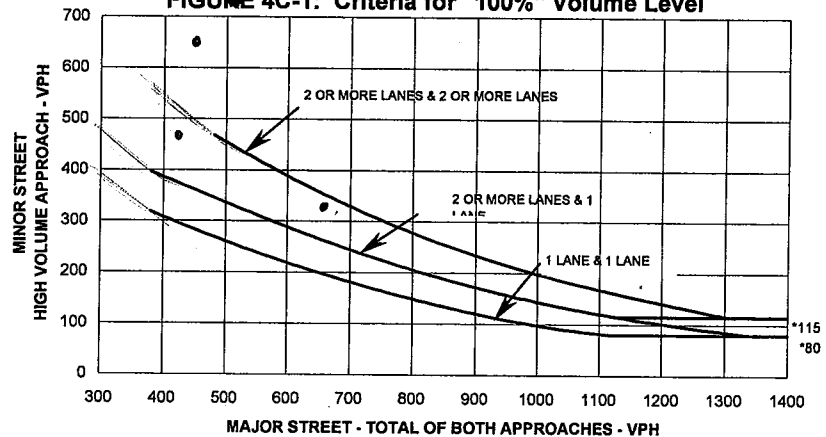
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

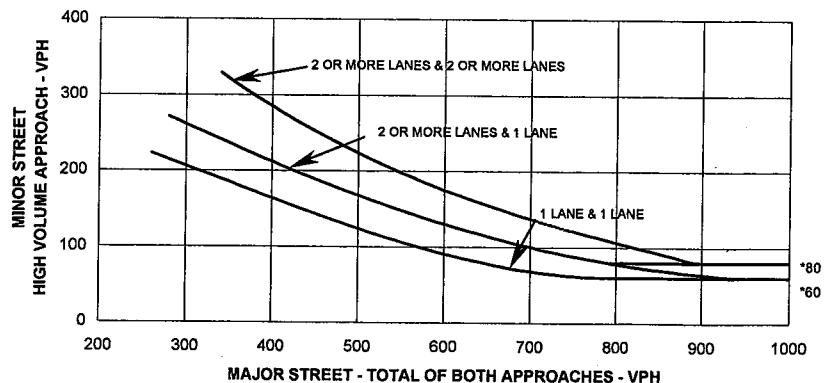
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	458	650
800	508	719
900	432	474
1700	642	309

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/10/08  
Major Street: Congress St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: I-93 Ramp / ESR Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
8:00	508	#19

#### Criteria

#### 1. Delay on Minor Approach \*(vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

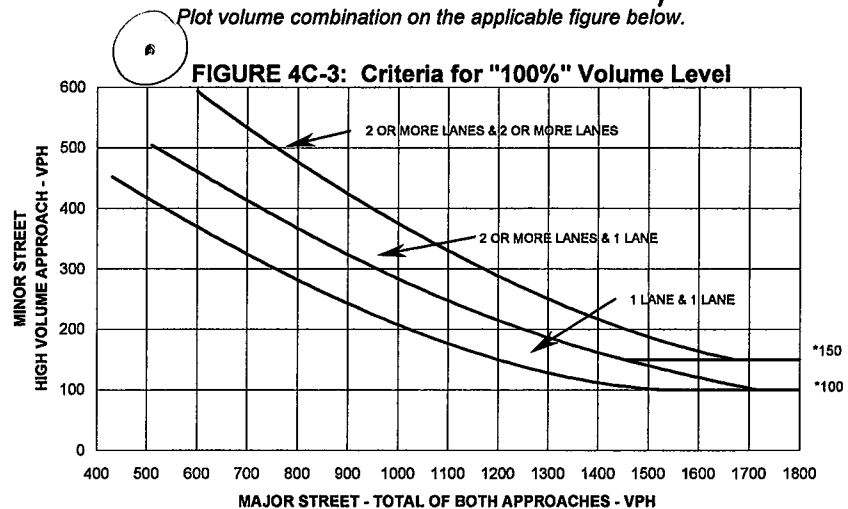
#### 2. Volume on Minor Approach \*(vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

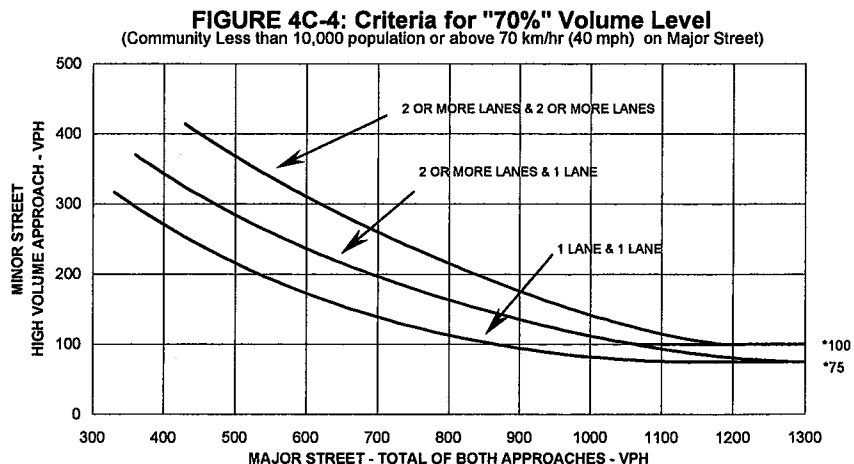
#### 3. Total Entering Volume \*(vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/10/08

Major Street: Congress St.  
Minor Street: Ramp / ESR

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	2			
	10 <sup>00</sup>	2			
	16 <sup>00</sup>	3			
	17 <sup>00</sup>	8			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/10/08  
Major Street: Congress St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Boston Wharf Rd (MSR) Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours								
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>	
	1		2 or more										
Approach Lanes	1		2 or more										
Volume Level	100%	70%	100%	70%									
Both Approaches on Major Street	500 (400)	350	600 (480)	420	628	740	627	460	544	531	768	823	
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	160	200	139	125	149	159	252	348	

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours								
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>	
	1		2 or more										
Approach Lanes	1		2 or more										
Volume Level	100%	70%	100%	70%									
Both Approaches on Major Street	750 (600)	525	900 (720)	630	628	740	627	460	544	531	768	823	
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	160	260	139	125	149	159	252	348	

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/10/00  
Major Street: Congress Street Lanes: 2 Critical Approach Speed: 30  
Minor Street: Boston Wharf Rd (NSR) Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

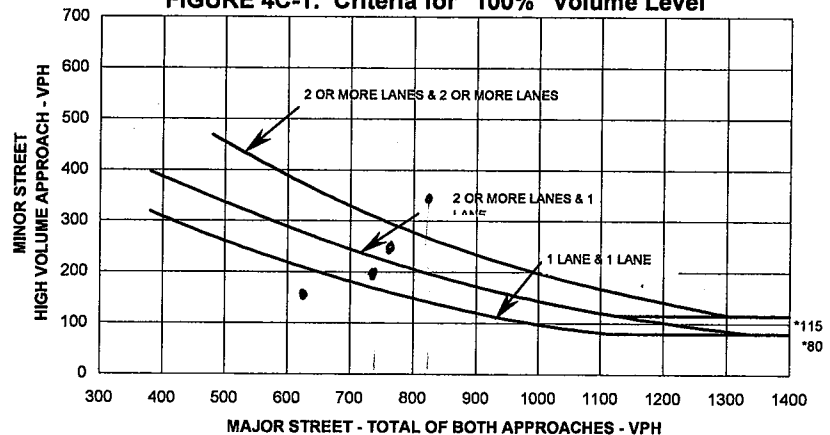
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

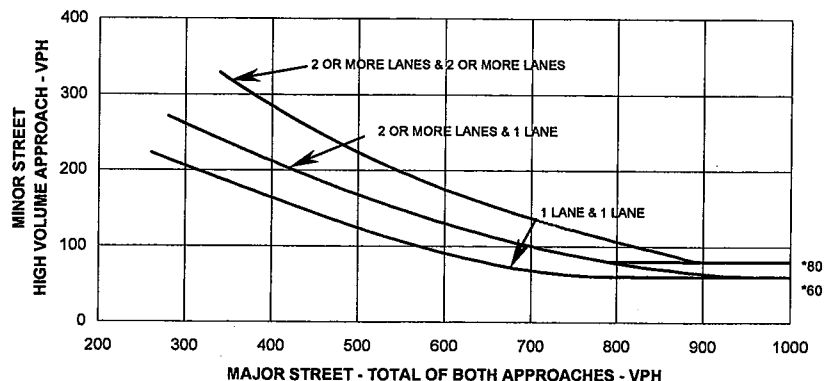
FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	628	160
800	740	200
1600	768	252
1700	823	348

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Silva  
County: Suffolk Date: 12/10/08  
Major Street: Congress St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Boston Wharf Rd (WSR) Lanes: 1

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	823	340

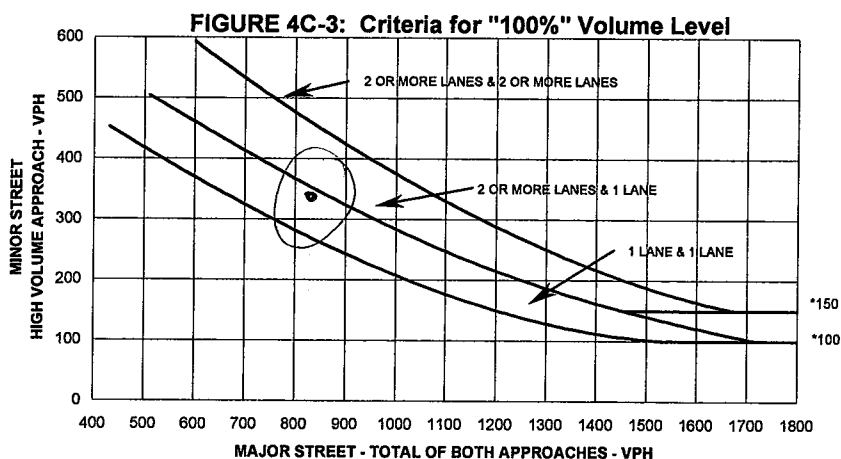
#### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*	20	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

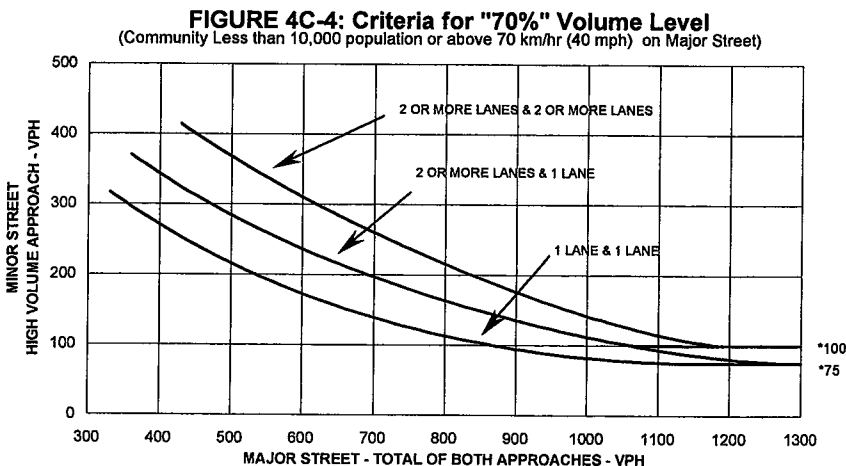
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	340	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		823
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Silu  
County: Suffolk Date: 12/10/08  
Major Street: Congress St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: Boston Wharf Rd. (WSP) Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	800	10			
	1500	11			
	1600	21			
	1700	22			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
 County: Suffolk Date: 12/10/08  
 Major Street: Congress St. Lanes: 2 Critical Approach Speed: 30  
 Minor Street: Boston Wharf Rd. (WSP) Lanes: 1

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour						
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		<u>0</u>		<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☐ Yes ☒ No

Criteria				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: <u>1224</u>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant:	1 <u>N</u> 2 <u>N</u> 3 <u>N</u>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		<u>NO</u> <u>DATA</u>		← Hour			
				← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				<input checked="" type="checkbox"/>
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

### CONCLUSIONS

Warrants Satisfied: 

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Remarks: \_\_\_\_\_

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Northern Ave.  
Minor Street: B Street

Engineer: A. Silva  
Date: 12/10/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	1000	1200	1300	1400	1500	1600	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more		800	1000	1200	1300	1400	1500	1600	1700
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1179	1251	1399	1156	1180	1185	1190	1336
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	420	259	400	320	328	313	303	378

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	1000	1200	1300	1400	1500	1600	1700
	100%	70%	100%	70%								
Approach Lanes	1		2 or more		800	1000	1200	1300	1400	1500	1600	1700
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1179	1251	1399	1156	1180	1185	1190	1336
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	420	259	400	320	328	313	303	378

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sin  
Date: 12/10/08

Major Street: Northern Ave  
Minor Street: B Street

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

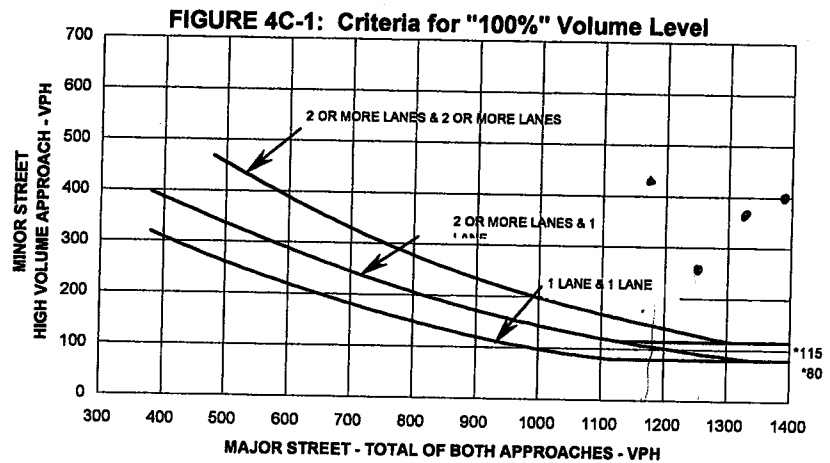
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

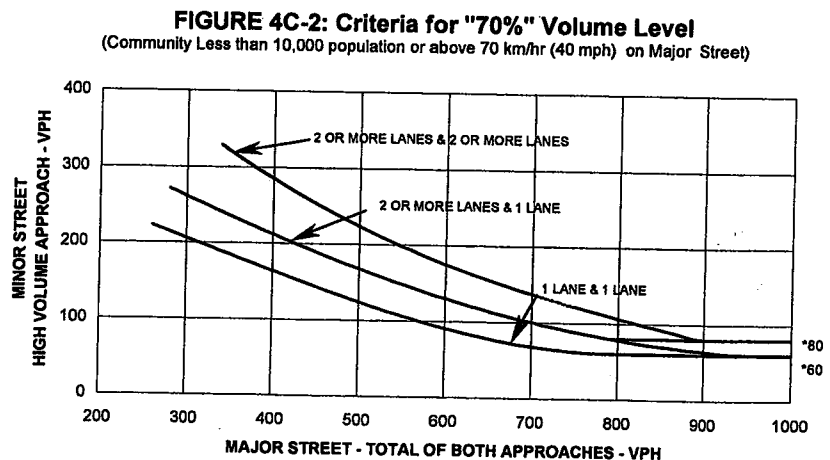
Plot four volume combinations on the applicable figure below.

\*All points  
above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	1179	420
10 <sup>00</sup>	1251	259
12 <sup>00</sup>	1399	400
17 <sup>00</sup>	1336	378



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A.SIU  
Date: 12/10/08

Major Street: Northern Ave  
Minor Street: B Street

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1200	1399	400

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

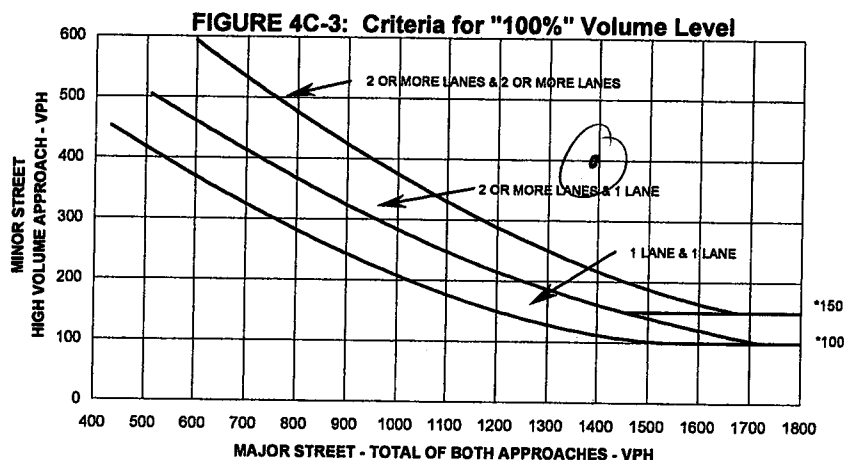
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		400
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

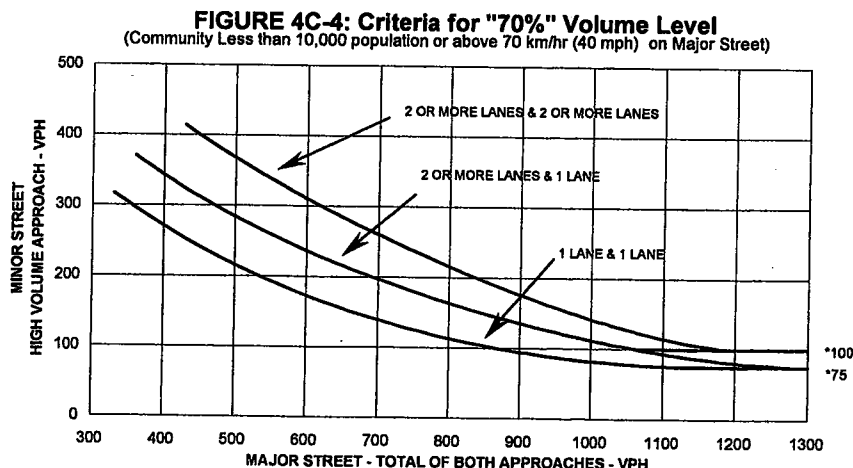
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1799	1730
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Northern Ave  
Minor Street: B Street

Engineer: A. Siu  
Date: 12/10/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	1700	359			
	1300	237			
	1400	265			
	1700	212			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/10/08  
Major Street: Northern Ave Lanes: 2 Critical Approach Speed: 30  
Minor Street: B Street Lanes: 2

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)			X			
	Warrant 1, Condition B (80% satisfied)			X			
	Warrant 4, Pedestrian Volume at 80% of volume requirements: 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour			X		X	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		2		X

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: 1799		X		X	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant: 1 2 3	Satisfied?: Y Y Y	X		X	
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		NO DATA		← Hour			
				← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_

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## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Silu  
Date: 12/10/08  
Major Street: Northern Ave / Seaport Blvd.  
Minor Street: East Service Rd.  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	1 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1201	1352	1150	1173	1255	1277	1254	1371
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	444	634	480	499	455	455	241	335

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	1 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1261	1352	1150	1173	1255	1277	1254	1371
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	444	634	480	499	455	455	241	335

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Northern Ave / Seaport Blvd  
Minor Street: East Service Rd

Engineer: A. Sim  
Date: 12/10/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

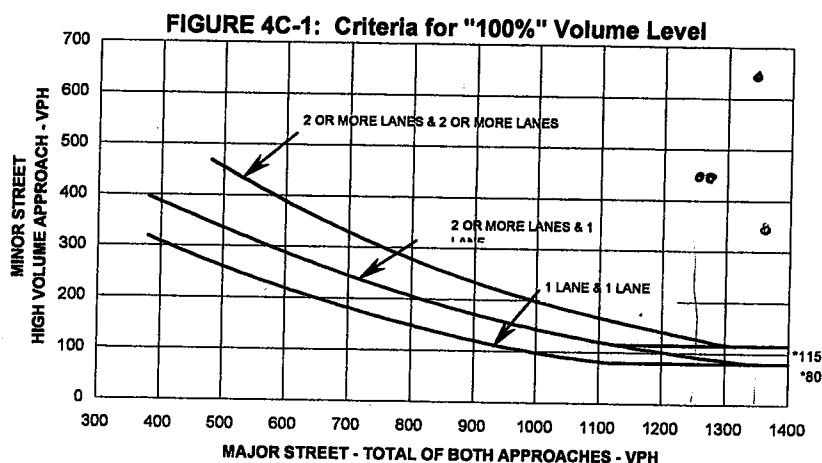
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

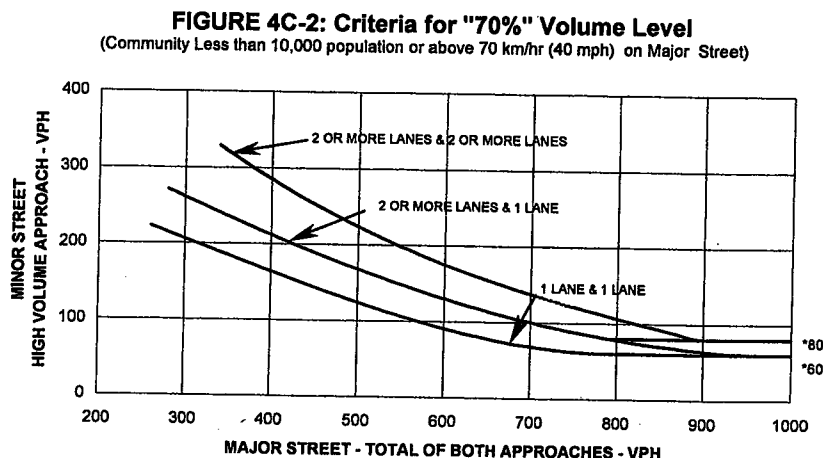
Plot four volume combinations on the applicable figure below.

\* All points  
above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1352	634
1100	1255	455
1200	1277	455
1700	1371	335



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Northern Ave / Seaport Blvd  
Minor Street: East Service Rd

Engineer: A. Silva  
Date: 12/10/09  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
8:00	1:52	6:34

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

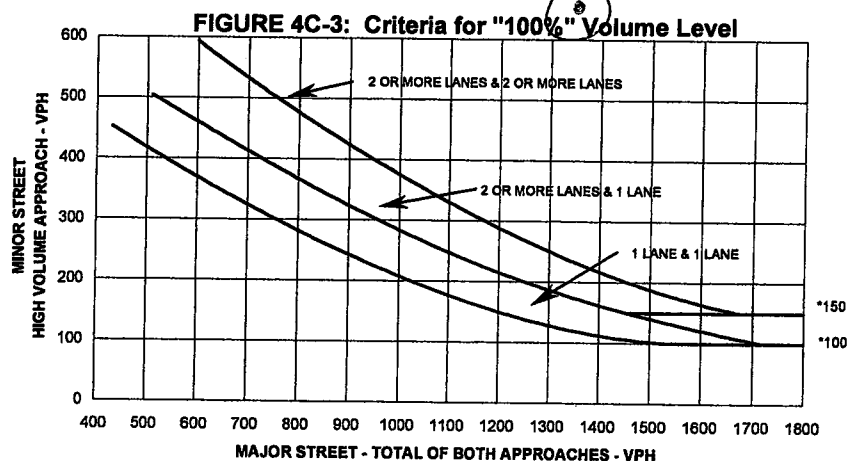
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		634
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

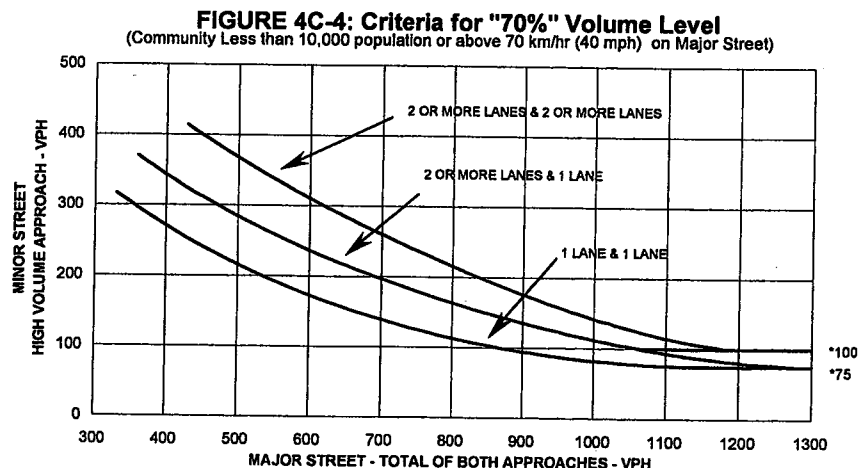
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		2036
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/10/08  
Major Street: Northern Ave/Seaport Blvd  
Minor Street: East Service Rd  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	1100	29			
	1400	35			
	1600	42			
	1700	97			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sil  
Date: 12/10/08

Major Street: Seaport Blvd.  
Minor Street: Sleeper St.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1411	1604	1357	958	938	939	999	1177
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	85	83	68	69	240	229	254	257

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☒ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1411	1604	1357	958	938	939	999	1177
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	85	83	68	69	240	229	254	257

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sin  
Date: 12/10/08

Major Street: Seaport Blvd.  
Minor Street: Sleeper St.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

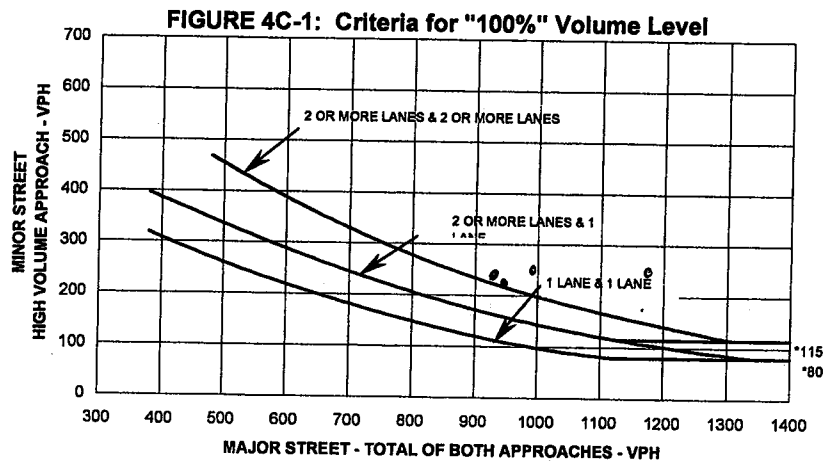
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

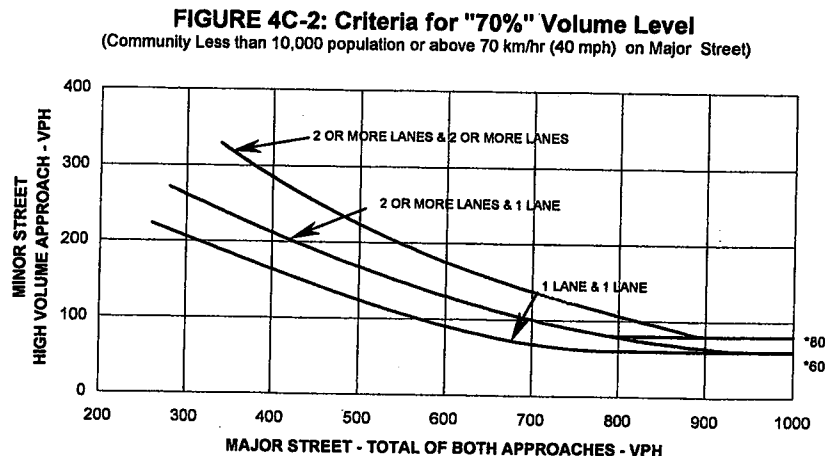
Plot four volume combinations on the applicable figure below.

\*All points above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
1400	938	240
1500	939	229
1600	999	254
1700	1177	257



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Seaport Blvd  
Minor Street: Sleeper St.

Engineer: A. Siu  
Date: 12/10/08  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
190	1177	257

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

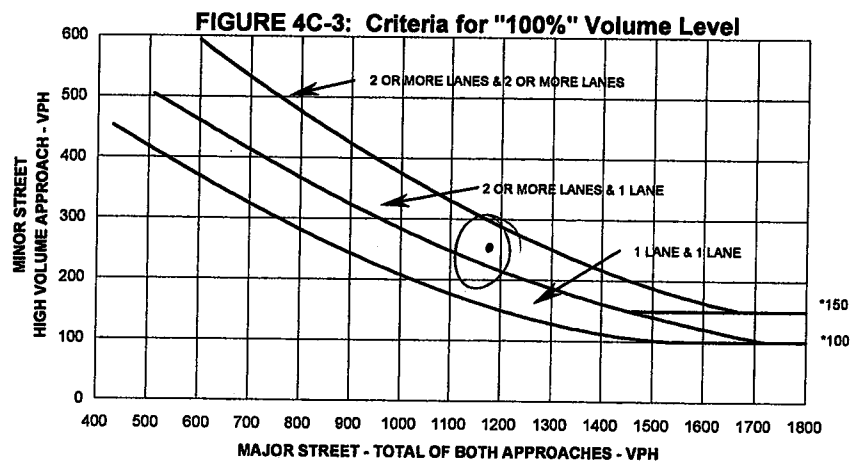
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		257
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

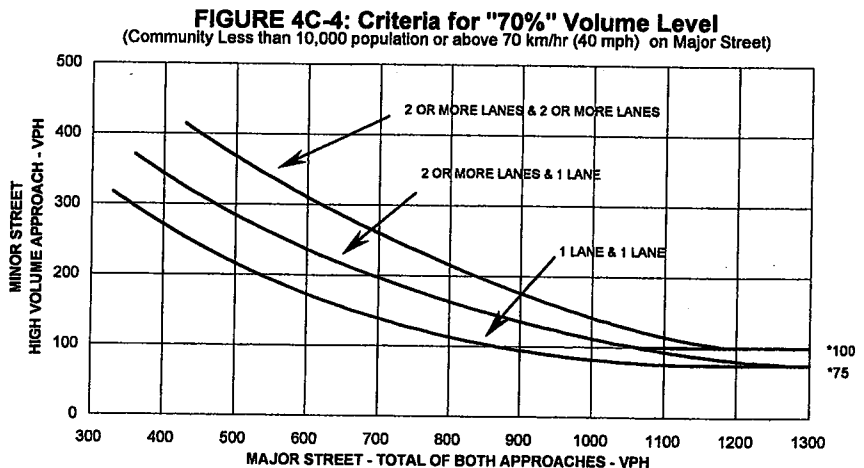
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		1453
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/10/08  
Major Street: Seaport Blvd Lanes: 2 Critical Approach Speed: 30  
Minor Street: Sleeper St Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	12 <sup>00</sup>	83			X
	13 <sup>00</sup>	79			
	14 <sup>00</sup>	83			
	17 <sup>00</sup>	74			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Congress St.  
Minor Street: Dorchester Ave

Engineer: A. Silva  
Date: 12/10/02  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	2 or more										
Approach Lanes	1	2 or more										
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	811	825	726	694	678	768	892	912
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	277	200	161	154	178	196	244	263

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	2 or more										
Approach Lanes	1	2 or more										
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	811	825	726	694	678	768	892	912
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	277	200	161	154	178	196	244	263

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/10/08  
Major Street: Congress St.  
Minor Street: Dorchester Ave  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

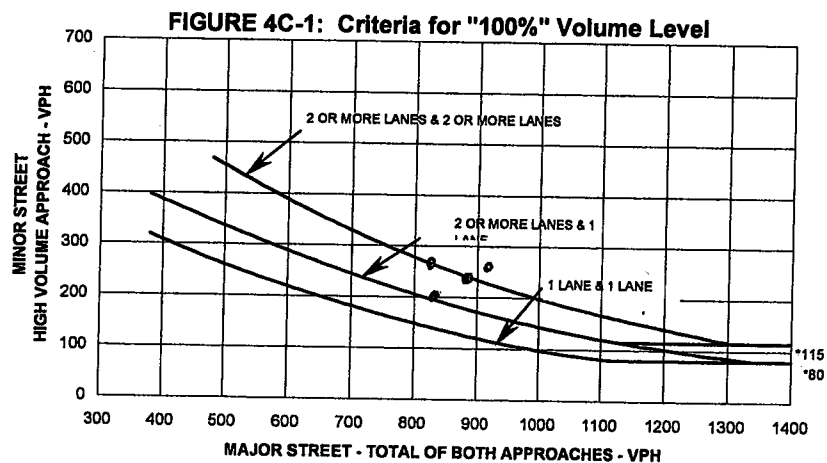
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

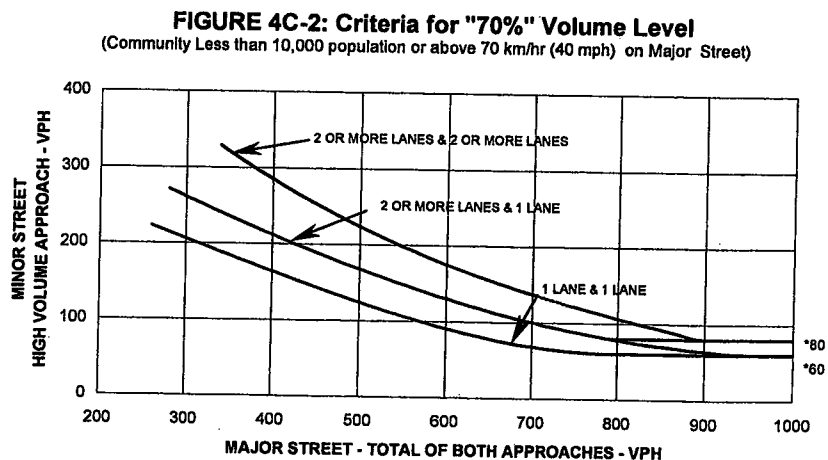
Plot four volume combinations on the applicable figure below.

\* All points above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	811	277
9 <sup>00</sup>	875	200
16 <sup>00</sup>	892	244
17 <sup>00</sup>	912	263



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/10/08

Major Street: Congress St.  
Minor Street: Dorchester Ave

Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	912	263

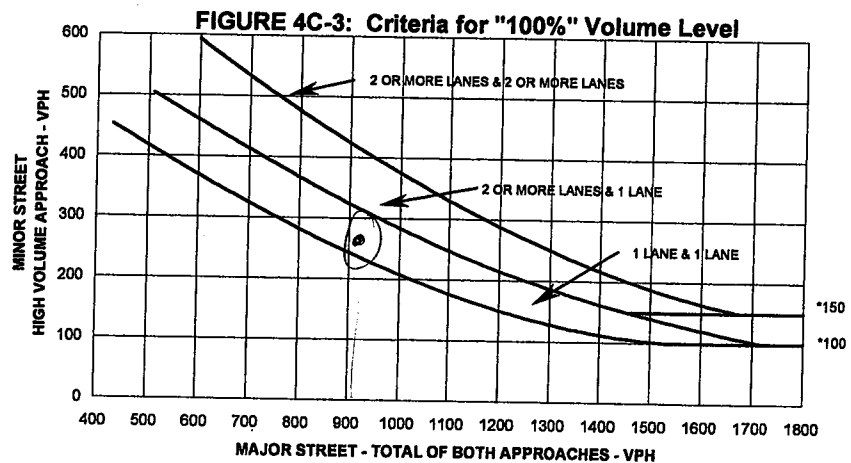
### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*	5.71	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

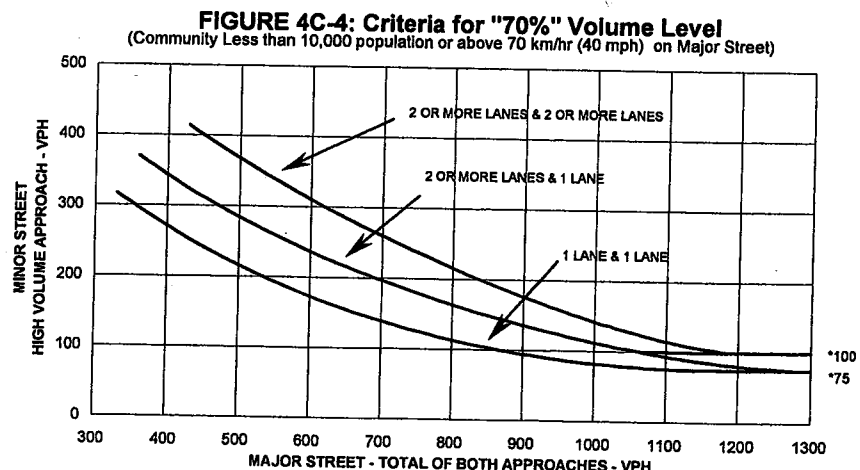
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	263	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1175	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/10/08

Major Street: Congress St.  
Minor Street: Dorchester Ave.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	1400	56			X
	1500	89			
	1600	112			
	1700	166			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

70

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Congress St.  
Minor Street: A Street

Engineer: A. Silu  
Date: 12/10/08  
Lanes: 1  
Lanes: 1 Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	2 or more										
Approach Lanes	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	701	812	605	550	572	644	707	810
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	239	255	215	189	206	336	320	343

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	2 or more										
Approach Lanes	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	701	812	605	550	572	644	707	810
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	239	255	215	189	206	336	320	343

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Congress St.  
Minor Street: A Street

Engineer: A. Silva  
Date: 12/10/08  
Lanes: 1  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level  
☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

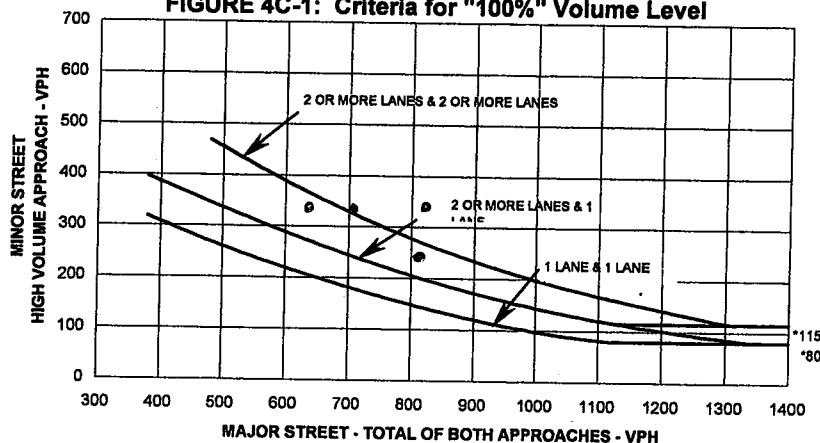
Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

\* All points  
above line

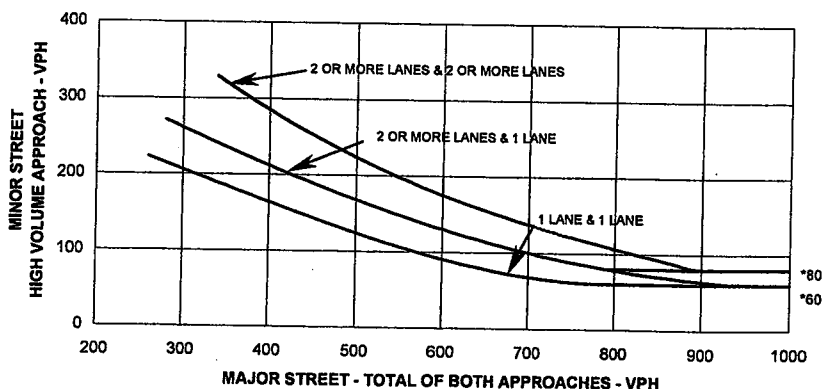
Four Highest Hours	Volumes	
	Major Street	Minor Street
800	812	255
1506	644	336
1600	707	320
1700	810	343

FIGURE 4C-1: Criteria for "100%" Volume Level



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A.SIU  
County: Suffolk Date: 12/10/08  
Major Street: Congress St. Lanes: 1 Critical Approach Speed: 30  
Minor Street: A Street Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
700	810	343

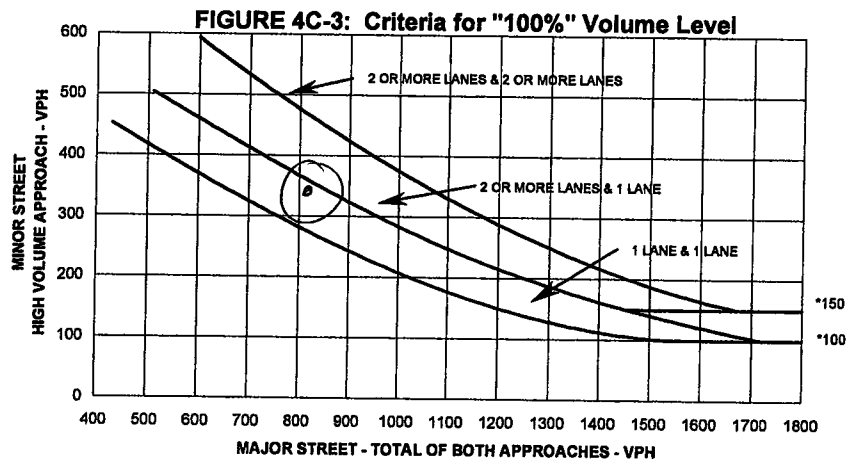
### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

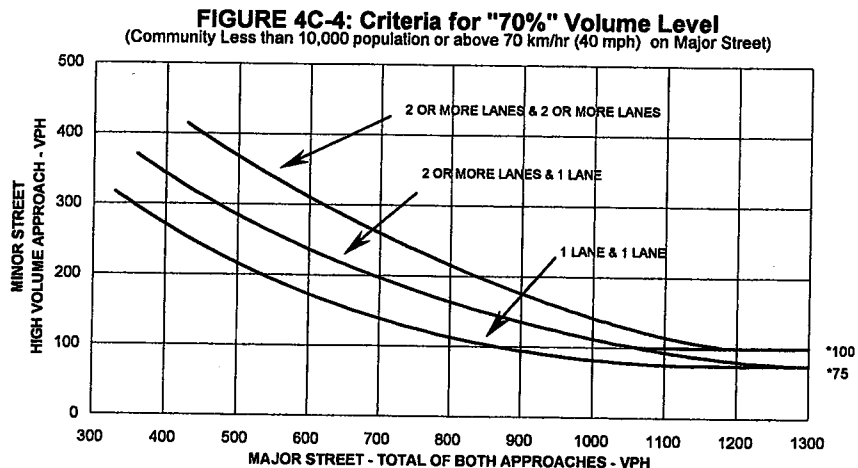
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	343	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		1182
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/10/08

Major Street: Congress St.  
Minor Street: #1 Street

Lanes: 1 Critical Approach Speed: 30  
Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	800	35			
	1200	67			
	1300	86			
	1700	48			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
 County: Suffolk Date: 12/10/08  
 Major Street: Congress St. Lanes: 1 Critical Approach Speed: 30  
 Minor Street: Hy Street Lanes: 1

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)			X			
	Warrant 1, Condition B (80% satisfied)				X		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:				X	X	
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour				X		
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		3		X

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
 Satisfied: ☐ Yes ☒ No

Criteria					Met?		Fulfilled?	
					Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume: <u>1182</u>		X		X	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant:	1 2 3	X			
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		<u>NO</u>	<u>DATA</u>		← Hour			
					← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				X
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

### CONCLUSIONS

Warrants Satisfied:

Remarks: \_\_\_\_\_



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sim  
Date: 12/10/08

Major Street: Summer St.  
Minor Street: West Side Dr.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	782	970	819	805	769	898	939	1092
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	4	8	11	25	33	39	35	44

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	782	970	819	805	769	898	939	1092
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	4	8	11	25	33	39	35	44

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sin  
Date: 12/10/08  
Major Street: Summer St.  
Minor Street: West side Dr.  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

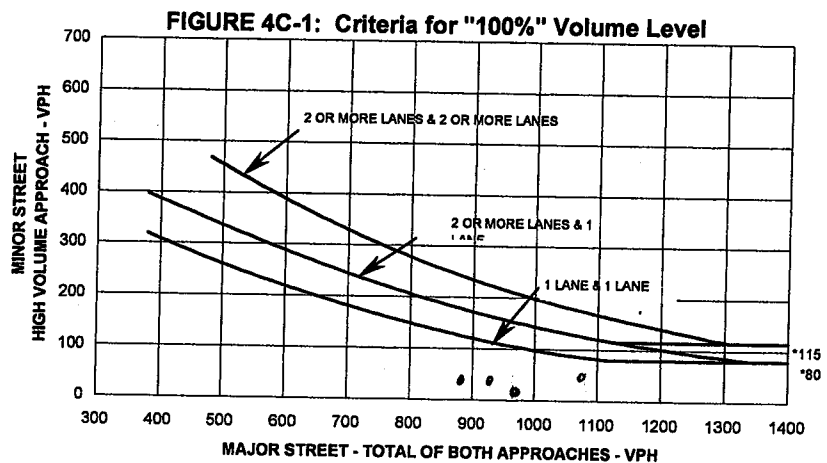
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

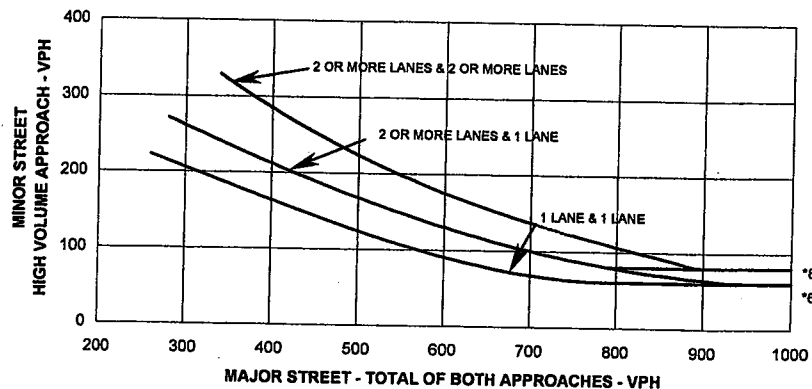
\* All points below line

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	976	8
1500	898	39
1600	939	35
1700	1092	44



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

**FIGURE 4C-2: Criteria for "70%" Volume Level**  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/10/08

Major Street: Summer St.  
Minor Street: West Side Dr.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	1092	44

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

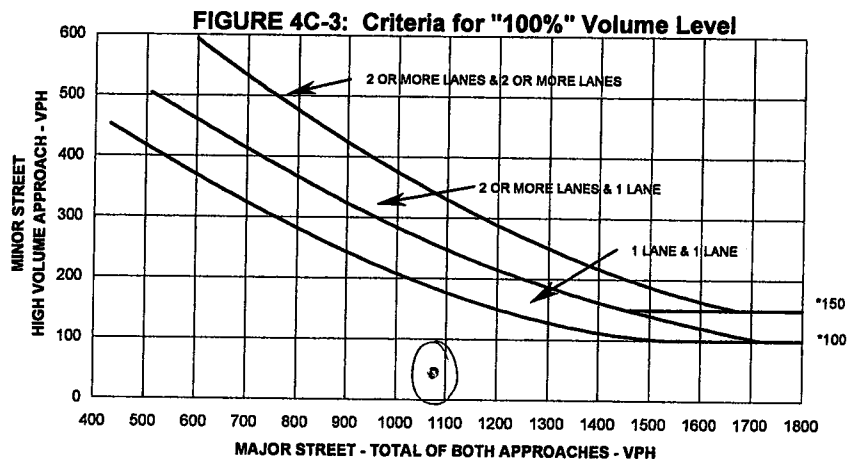
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	44	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

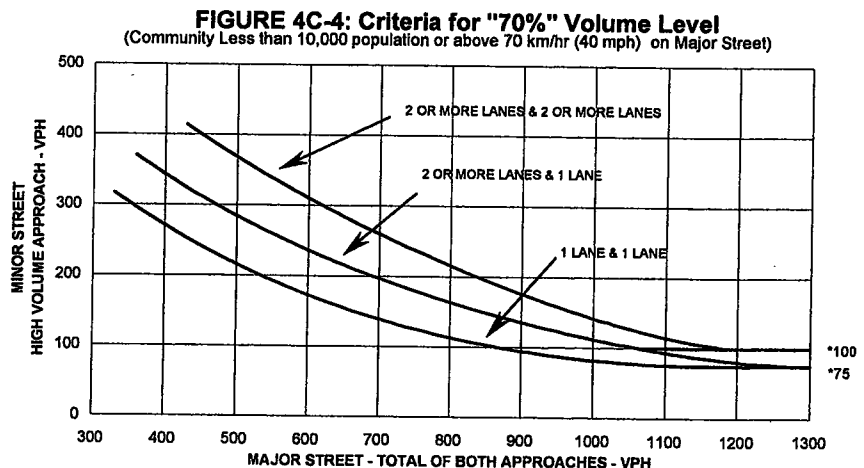
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1136	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silu  
Date: 12/10/09

Major Street: Summer St  
Minor Street: West Side Dr.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	9:00	35			X
	11:00	8			
	16:00	8			
	17:00	46			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/10/08  
Major Street: Summer St.  
Minor Street: World Trade Center  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	1 <sup>00</sup>	2 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	797	996	814	818	779	919	977	1185
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	46	57	52	49	53	41	63	90

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	1 <sup>00</sup>	2 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	797	996	814	818	779	919	977	1185
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	46	57	52	49	53	41	63	90

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sin  
Date: 12/10/08

Major Street: Summer St.  
Minor Street: World Trade Center Ave

Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

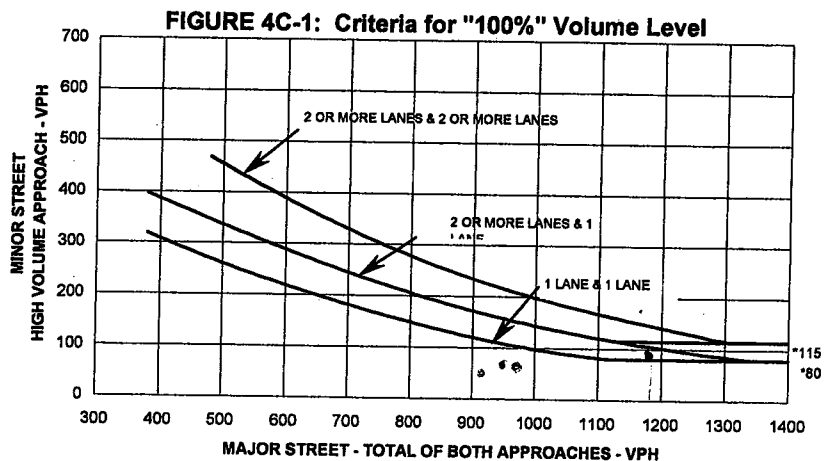
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

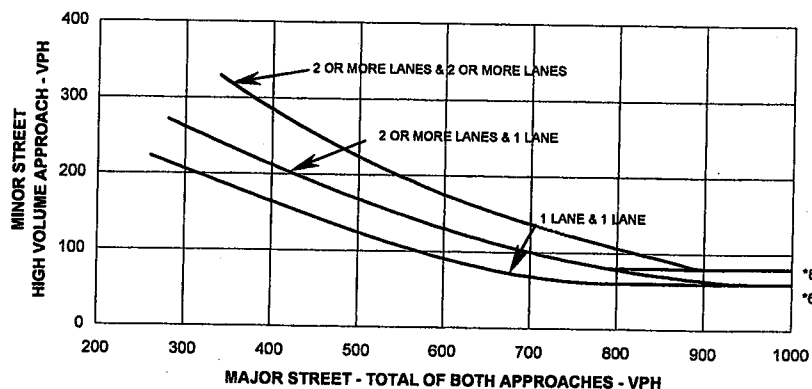
\* All points below line

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	996	57
1500	919	41
1600	977	63
1700	1185	90



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

**FIGURE 4C-2: Criteria for "70%" Volume Level**  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/10/08  
Major Street: Summer St.  
Minor Street: World Trade Center Ave  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	1125	90

### Criteria

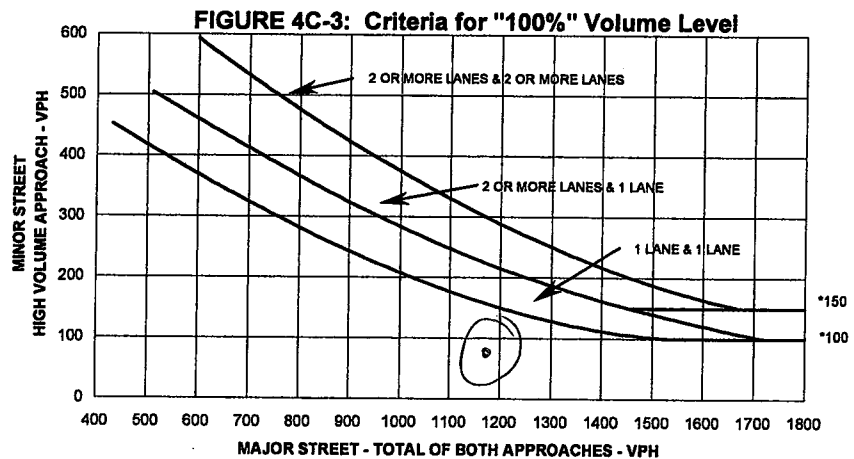
1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	70	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

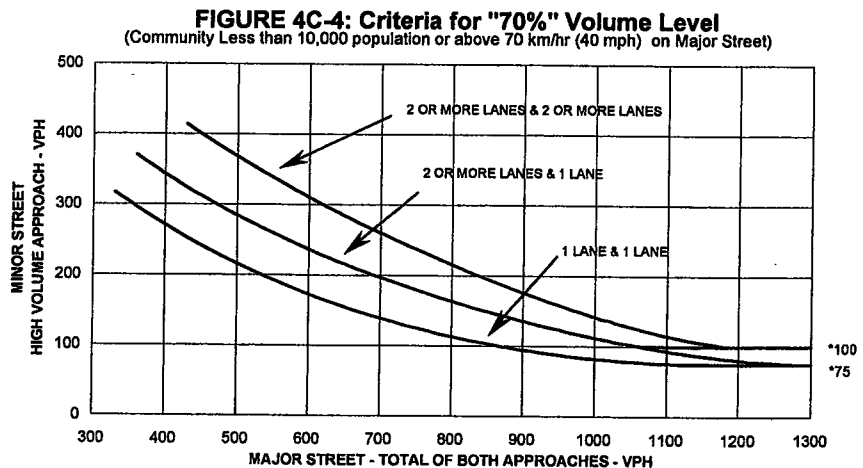
3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1315	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/10/08  
Major Street: Summer St. Lanes: 2 Critical Approach Speed: 30  
Minor Street: World Trade Center Ave Lanes: 1

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	900	469			
	1100	292			
	1400	287			
	1600	193			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Engineer: A. Siu  
Date: 12/10/08  
Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

**Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.**

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				X	X	
	Warrant 1, Condition B (80% satisfied)				X		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:						
	80 ped/hr for four (4) hours or						
	152 ped/hr for one (1) hour						
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		2		X

**Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.**

Criteria							Met?		Fulfilled?		
							Yes	No	Yes	No	
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.				Entering Volume:					X	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.				Warrant:		1	2			3
					Satisfied?:		N	N			N
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	N	O			D	A	T	A	← Hour		
									← Volume		

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				X
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

Warrants Satisfied: 

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Remarks: \_\_\_\_\_

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# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sim  
Date: 2/4/2009

Major Street: Seaport Blvd  
Minor Street: West Service Road

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1033	1368	1280	1003	821	828	827	1085
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	45	48	63	70	69	58	129	166

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1033	1368	1280	1003	821	828	827	1085
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	45	48	63	70	69	58	129	166

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. SIM  
Date: 7/4/2009

Major Street: Seaport Blvd  
Minor Street: West Service Road

Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

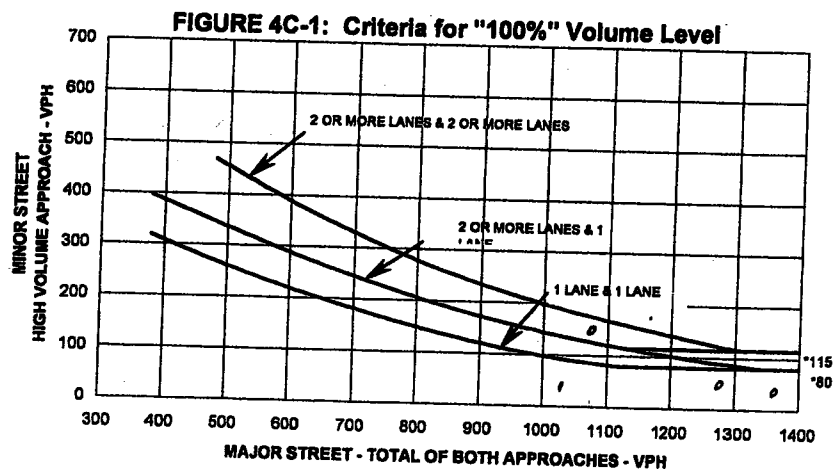
If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

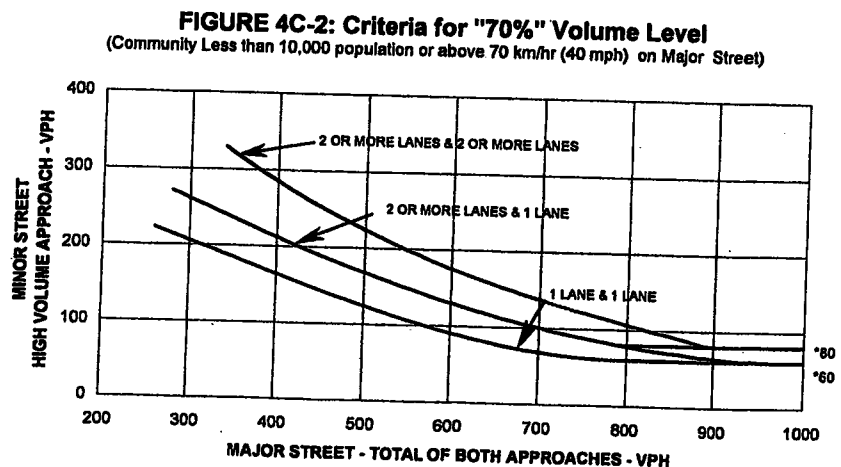
Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1033	45
800	1368	48
900	1280	63
1700	1085	166



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 4/4/2009

Major Street: Seaport Blvd  
Minor Street: West Service Rd

Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
8 <sup>00</sup>	13 <sup>00</sup>	4 <sup>00</sup>

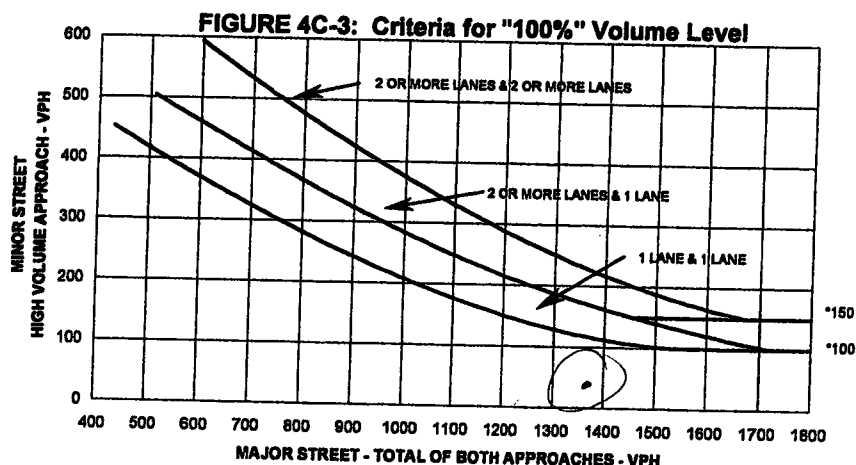
### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

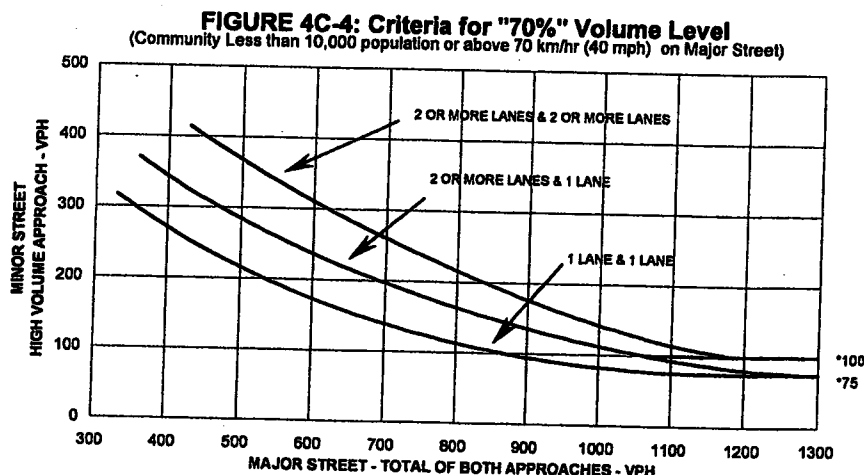
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	40	
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1416	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sil  
Date: 4/4/2009  
Major Street: Seaport Blvd.  
Minor Street: West Service Rd  
Lanes: 2  
Lanes: 1  
Critical Approach Speed: 30

## WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	700	12			
	900	15			
	1000	16			
	1200	10			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

## WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Students	Hour	Minutes	Gaps	Fulfilled?	
					Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.						
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.						
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.						

## WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Engineer: A. Sin  
Date: 2/4/2009  
Lanes: 2 Critical Approach Speed: 30  
Lanes: 1

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)						
	Warrant 1, Condition B (80% satisfied)						
	Warrant 4, Pedestrian Volume at 80% of volume requirements:						
	80 ped/hr for four (4) hours or						
	152 ped/hr for one (1) hour						
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		0		X

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria							Met?		Fulfilled?	
							Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.				Entering Volume:					
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.			Warrant:		1	2	3		
				Satisfied?:						
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	NO		DATA				← Hour			
							← Volume			

Characteristics of Major Routes		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				X
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

Warrants Satisfied: 

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Remarks: \_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany St.  
Minor Street: SSCONN

Engineer: A. Siu  
Date: 12/29/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	604	575	657	659	826	1145	1071	1299
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	57	66	66	62	58	74	89	104

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	604	575	657	659	826	1145	1071	1299
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	57	66	66	62	58	74	89	104

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany St.  
Minor Street: SSLOKIN

Engineer: A. Sin  
Date: 12/29/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

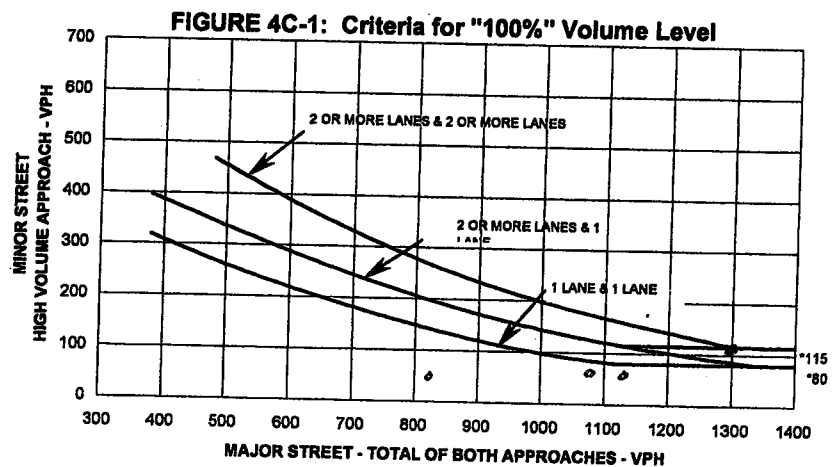
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

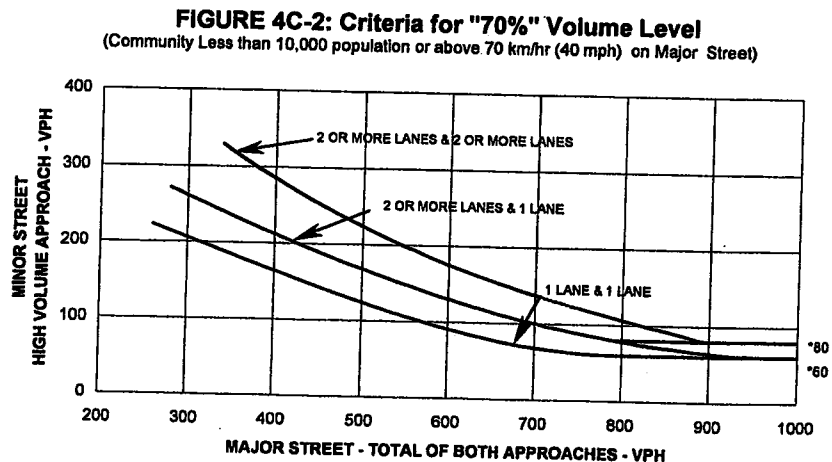
Plot four volume combinations on the applicable figure below.

\* All points below line

Four Highest Hours	Volumes	
	Major Street	Minor Street
1400	826	58
1500	1145	74
1600	1071	89
1700	1299	104



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany St.  
Minor Street: SSCONN

Engineer: A. Siu  
Date: 12/29/08  
Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
1700	1299	104

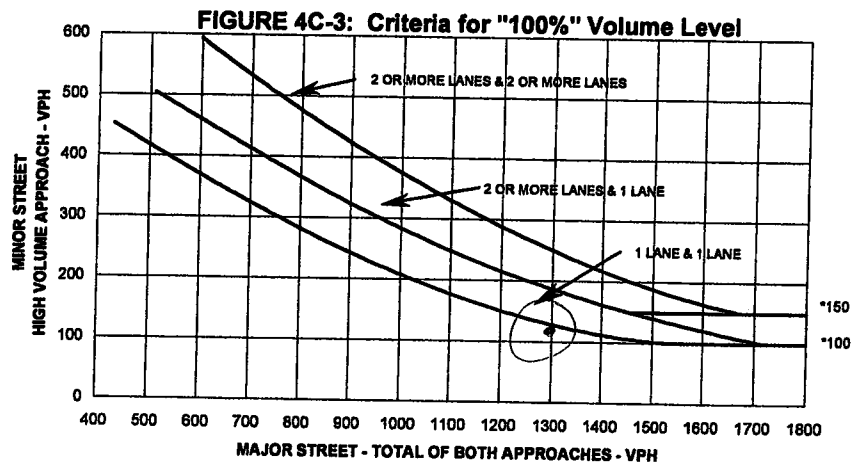
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

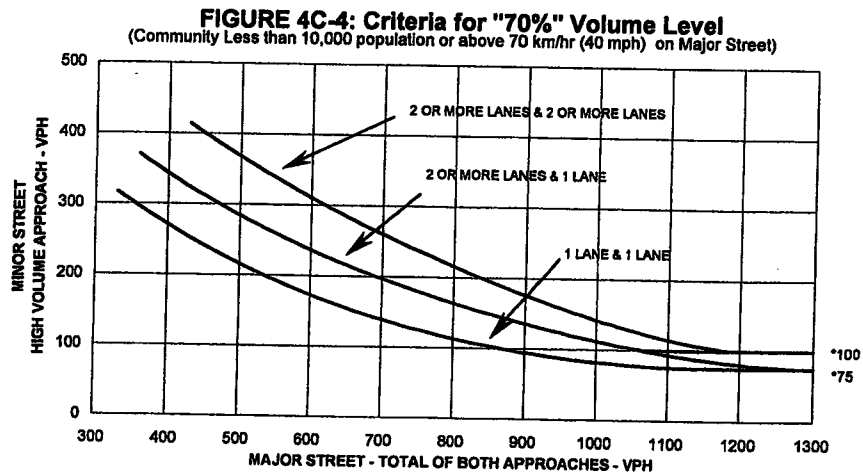
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		104
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1299	1
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany St.  
Minor Street: SSCONV

Engineer: A. Sullivan  
Date: 12/29/08  
Lanes: 3  
Lanes: 2 Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		0			
		0			
		0			
		0			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany St.  
Minor Street: SSCOWN  
Engineer: A. Siu  
Date: 12/29/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:				<input checked="" type="checkbox"/>		
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		<u>0</u>		<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume:	<input checked="" type="checkbox"/>			
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant: 1 2 3		<input checked="" type="checkbox"/>		
			Satisfied?: N N N				<input checked="" type="checkbox"/>
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		<u>NIO</u>	<u>DATA</u>	← Hour			
				← Volume			

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:				
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_  
\_\_\_\_\_

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: SuffolkEngineer: A. Sim  
Date: 12/29/00Major Street: Broadway  
Minor Street: Frontage Rd.Lanes: 2 Critical Approach Speed: 30  
Lanes: 3**Volume Level Criteria**

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

**WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME**

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.

Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No**Condition A - Minimum Vehicular Volume**100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1501	1637	1213	1051	1228	1545	1303	1397
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	725	761	666	642	679	913	780	620

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

**Condition B - Interruption of Continuous Traffic**

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1501	1637	1213	1051	1228	1545	1303	1397
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	725	761	666	642	679	913	780	620

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

**WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME**

Delay is not excessive.

Not Applicable: ☐**WARRANT 3 - PEAK HOUR**

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Broadway  
Minor Street: Frontage Rd.

Engineer: A. Siu  
Date: 12/29/06  
Lanes: 2  
Lanes: 3  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

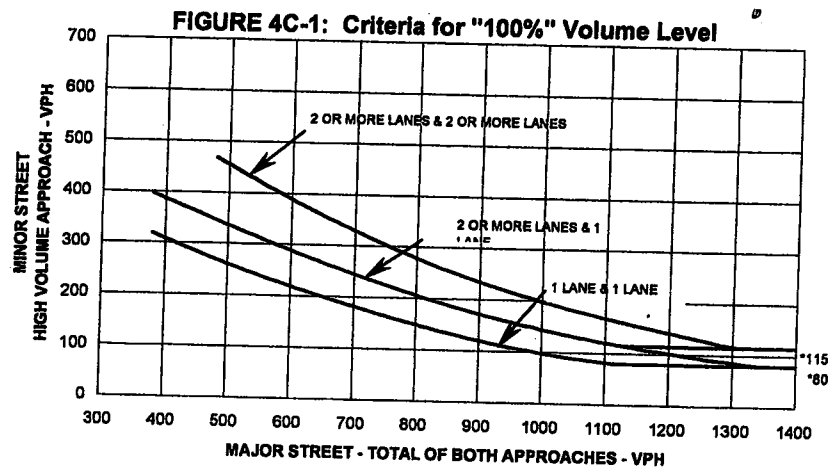
## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

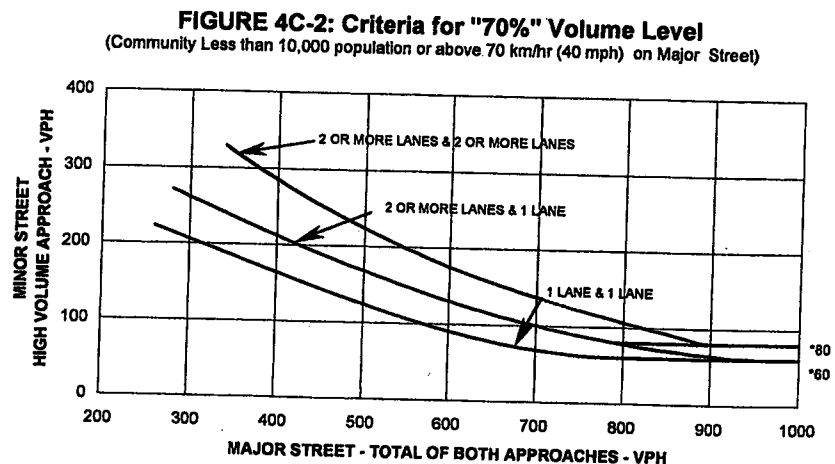
Plot four volume combinations on the applicable figure below.

\* All points  
above line



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1501	725
800	1637	761
1500	1545	913
1600	1363	780



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Broadway  
Minor Street: Frontage Rd.

Engineer: A. Siu  
Date: 12/29/08  
Lanes: 2  
Lanes: 3  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1500	1545	1613

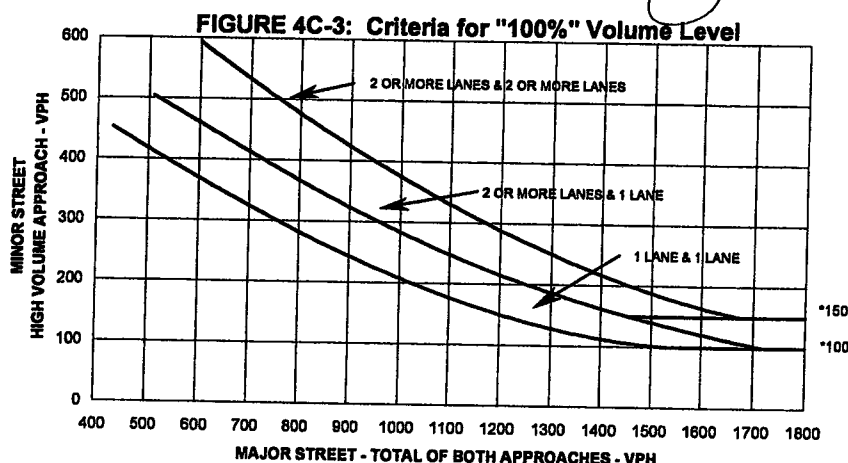
### Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

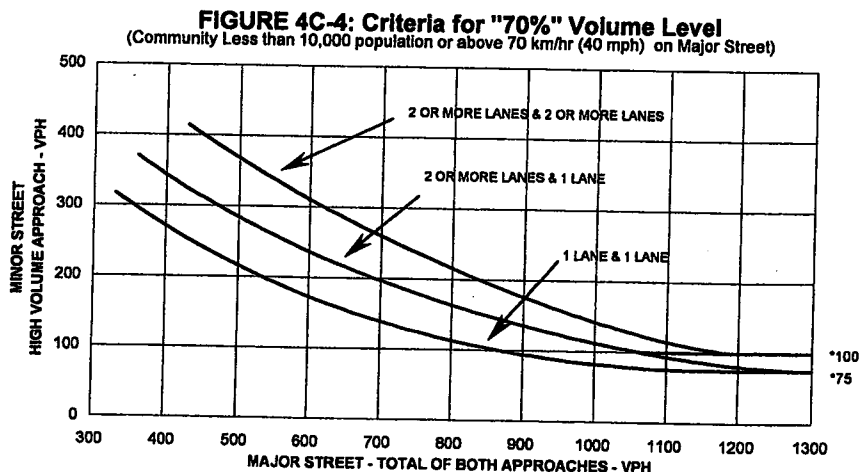
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Broadway  
Minor Street: Frontage Rd.

Engineer: A. Siu  
Date: 12/29/08  
Lanes: 2  
Lanes: 3  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	9 <sup>00</sup>	9			
	1 <sup>00</sup>	8			
	1 <sup>00</sup>	17			
	1 <sup>00</sup>	25			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/29/08

Major Street: Broadway  
Minor Street: Frontage Rd.

Lanes: 2  
Lanes: 3  
Critical Approach Speed: 30

## WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)		X			
	Warrant 1, Condition B (80% satisfied)		X			
	Warrant 4, Pedestrian Volume at 80% of volume requirements:			X	X	
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour					
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months:		23		X	

## WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria				Met?		Fulfilled?	
				Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: 2458		X		X	
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant:	1 2 3	X			
		Satisfied?:	Y Y Y				
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	NO	DATA		← Hour			
				← Volume			

Characteristics of Major Routes			Met?		Fulfilled?	
			Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:		X			
	Minor Street:		X			
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:		X			
	Minor Street:		X			
3. Appears as a major route on an official plan.	Major Street:		X			
	Minor Street:		X			

## CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_  
\_\_\_\_\_

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Bennington Street  
Minor Street: Neptune Road

Engineer: A. Sim  
Date: 12/29/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	2 or more										
Approach Lanes	100%	70%	100%	70%								
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1437	1583	1123	1040	1284	1236	1307	1065
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	430	322	334	405	445	503	529	527

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	2 or more										
Approach Lanes	100%	70%	100%	70%								
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1437	1583	1123	1040	1284	1236	1307	1065
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	430	322	334	405	445	503	529	527

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Bennington Street  
Minor Street: Neptune Road

Engineer: A. Siu  
Date: 12/29/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

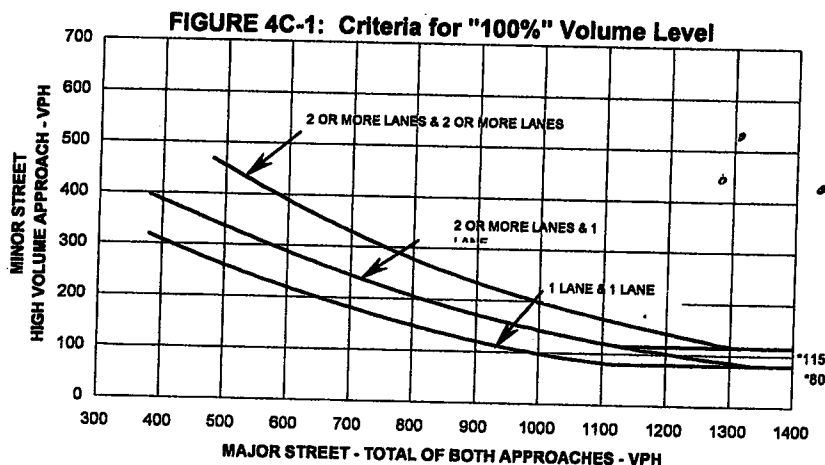
## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

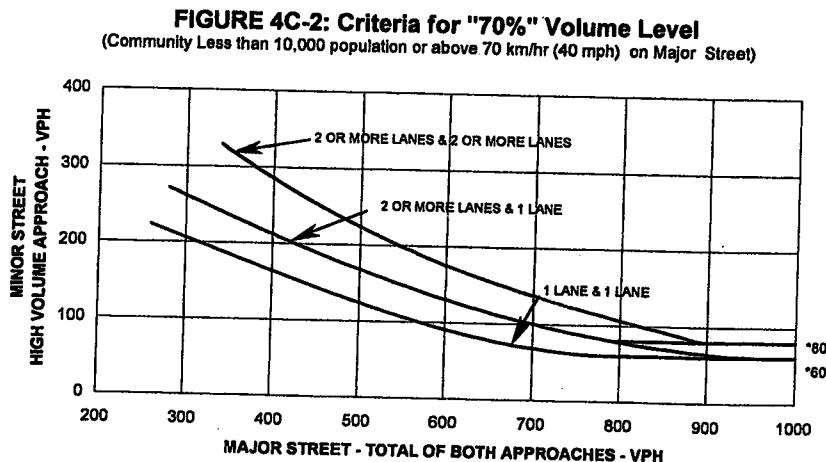
Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

\*All points  
above line



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1437	430
800	1583	322
1400	1284	445
1600	1307	529

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Bennington Street  
Minor Street: Neptune Road

Engineer: A. Siu  
Date: 12/29/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
8:00	1583	322

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

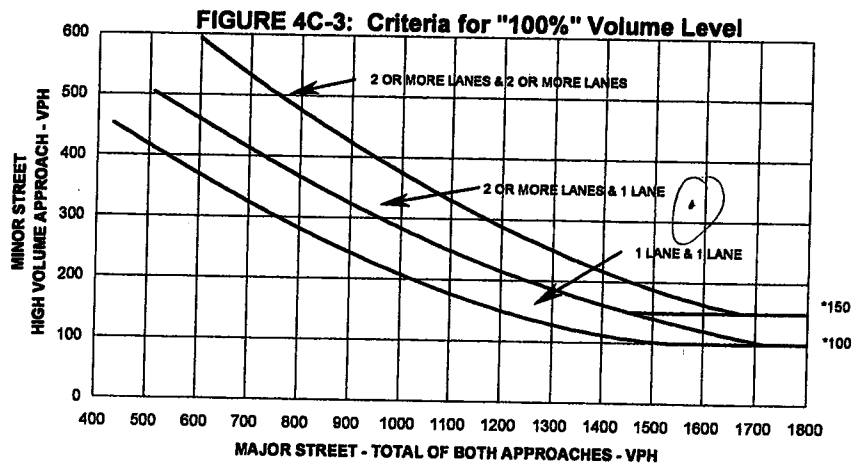
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		322
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

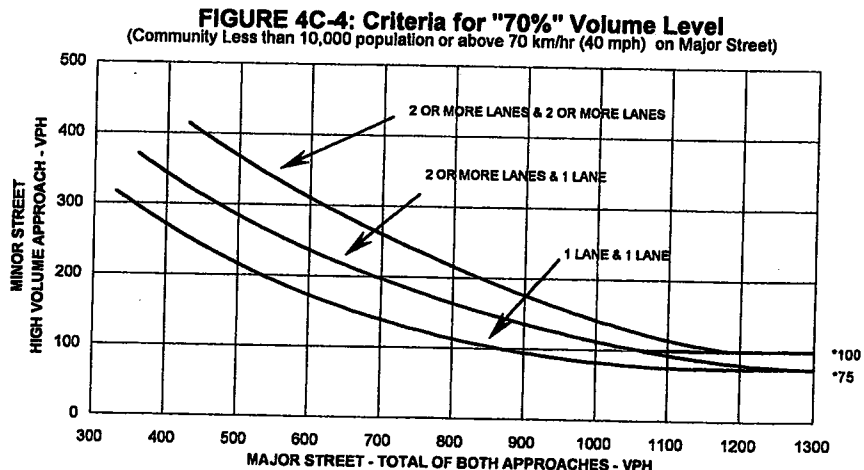
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		2067
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Bennington Street  
Minor Street: Neptune Road

Engineer: A. Sullivan  
Date: 12/29/08  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	9 <sup>00</sup>	21			
	12 <sup>00</sup>	19			
	15 <sup>00</sup>	18			
	16 <sup>00</sup>	27			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria		Fulfilled?	
		Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.			
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.			

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

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## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/29/08  
Major Street: Ramps / Kneeland St.  
Minor Street: SSCONN  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	937	997	937	810	681	483	516	581
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	45	55	55	55	50	184	134	172

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1500	1600	1700
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	937	997	937	810	681	483	516	581
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	45	55	55	55	50	184	134	172

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/29/08  
Major Street: Ramps / Kneeland St.  
Minor Street: SS CONN  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

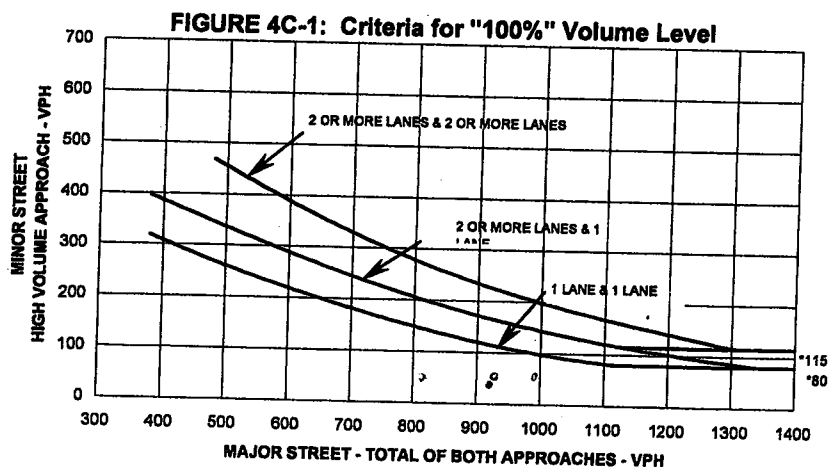
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

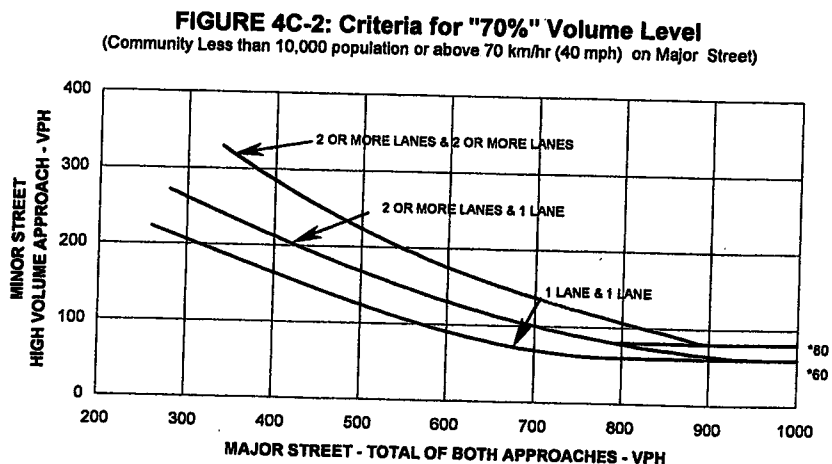
Plot four volume combinations on the applicable figure below.

All points below line

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	937	45
800	997	55
900	937	55
1000	810	55



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. SIM  
Date: 12/29/08

Major Street: Ramps / Kneeland St.  
Minor Street: SSCONN

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
800	997	55

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

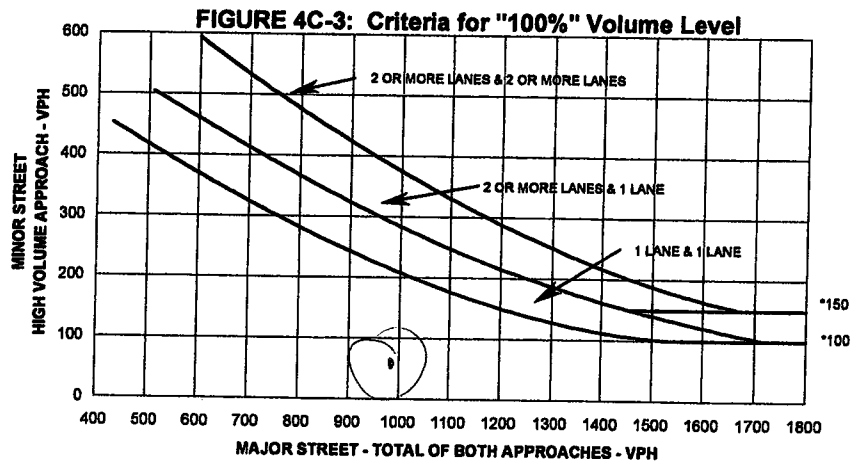
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

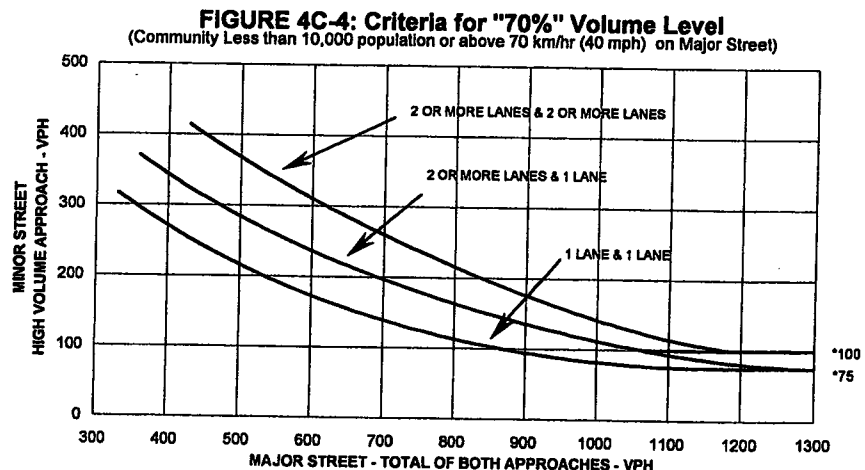
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		997
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silu  
Date: 12/29/08

Major Street: Ramps / Kneeland St.  
Minor Street: SSCONN

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		0			
		2			
		2			
		0			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

## WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

## WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes:  $\frac{2}{2}$  Critical Approach Speed: 30

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

# TRAFFIC SIGNAL WARRANT SUMMARY

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TRAFFIC ENGINEERING - 07/99  
Page 2 of 6

City: Boston  
County: Suffolk  
Major Street: West 4th St.  
Minor Street: Albany Street

Engineer: A. Sim  
Date: 12/29/08  
Lanes: 3  
Lanes: 3 Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1344	1386	1028	852	745	788	872	1084
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	585	686	701	612	575	786	561	673

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1344	1386	1028	852	745	788	872	1084
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	585	686	701	612	575	786	561	673

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sin  
Date: 12/29/08  
Major Street: W. 4th St.  
Minor Street: Albany St.  
Lanes: 3  
Lanes: 3  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

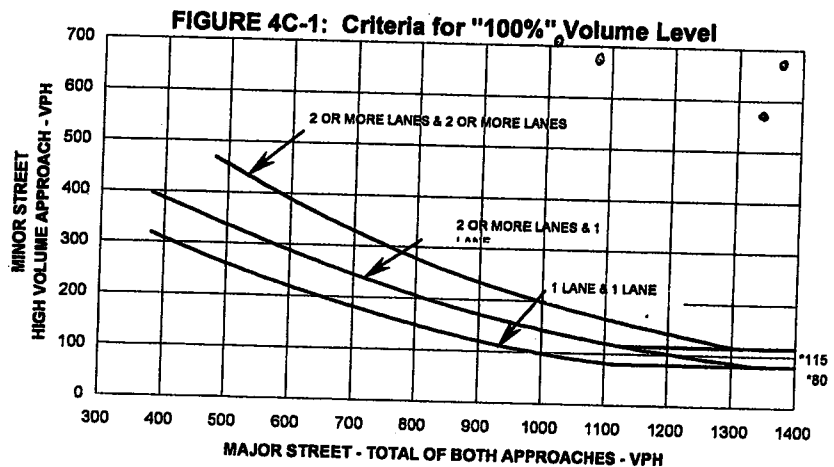
## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

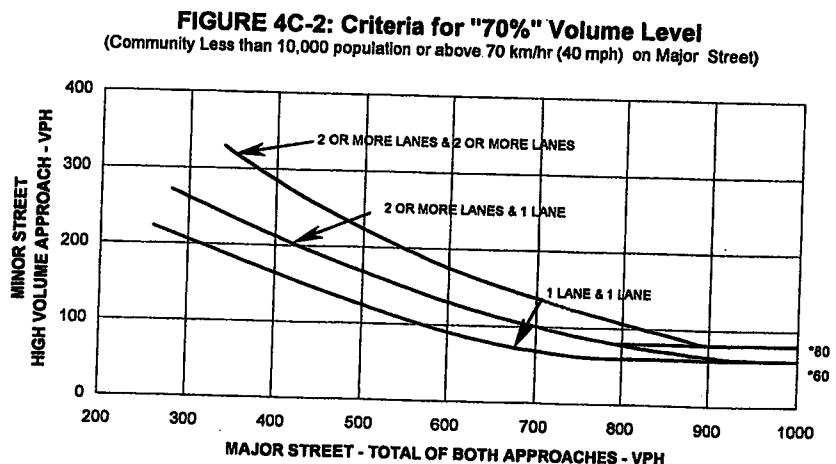
Plot four volume combinations on the applicable figure below.

\* All points above line



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1344	585
800	1386	686
900	1028	701
1700	1084	673



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/29/08

Major Street: W. 4th St.  
Minor Street: Albany St.

Lanes: 3  
Lanes: 3  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
6:00	12:00	6:00

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

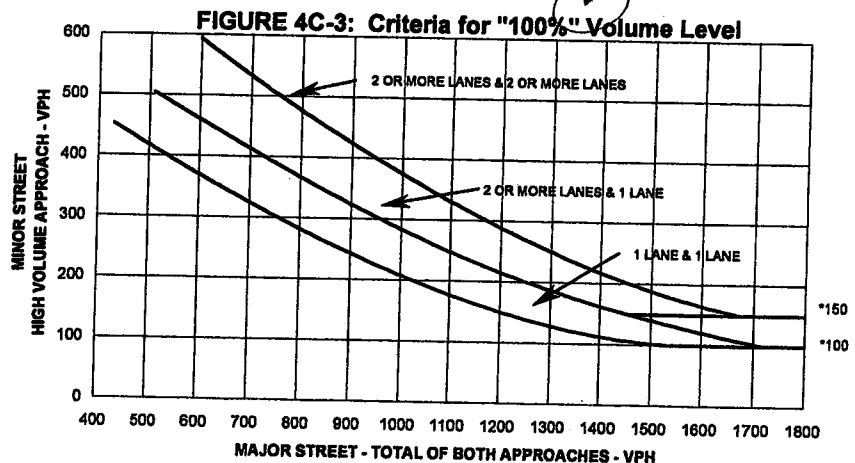
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

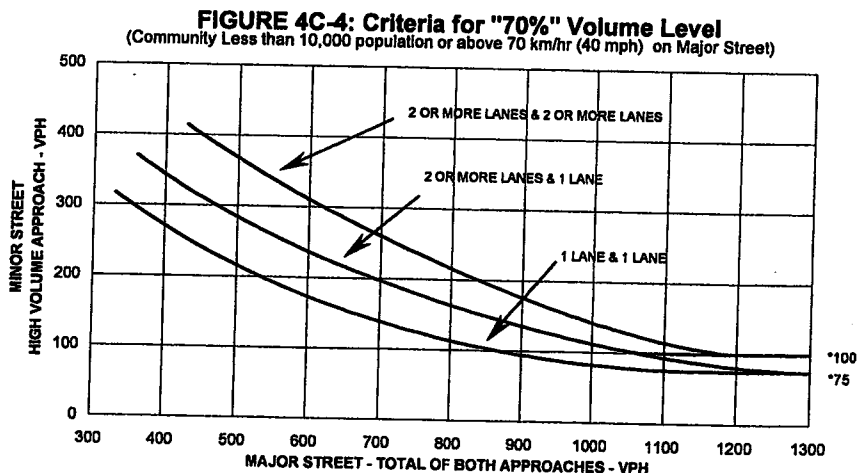
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/29/08  
Major Street: W. 4th St  
Minor Street: Albany St  
Lanes: 3  
Lanes: 3  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	9:00	23			
	11:00	24			
	15:00	22			
	17:00	22			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Critical Approach Speed: 30

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☒ No



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## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sil  
Date: 12/29/08  
Major Street: Frontage Road  
Minor Street: West 4th  
Lanes: 3  
Lanes: 3  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	1 <sup>00</sup>	2 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1289	1400	1206	1118	1051	1427	1380	1294
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	912	972	667	540	571	633	673	834

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	12 <sup>00</sup>	1 <sup>00</sup>	2 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1289	1400	1206	1118	1051	1427	1380	1294
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	912	972	667	540	571	633	673	834

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/29/08

Major Street: Frontage Rd.  
Minor Street: W. 4th

Lanes: 2  
Lanes: 3  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
800	1400	972

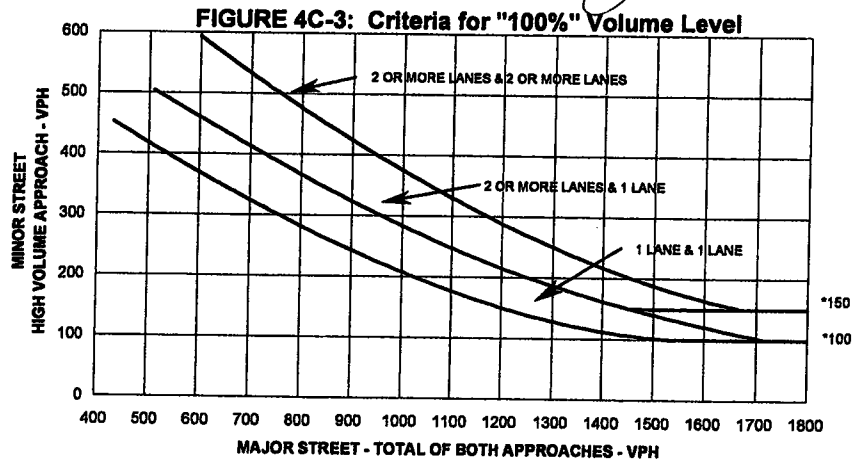
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

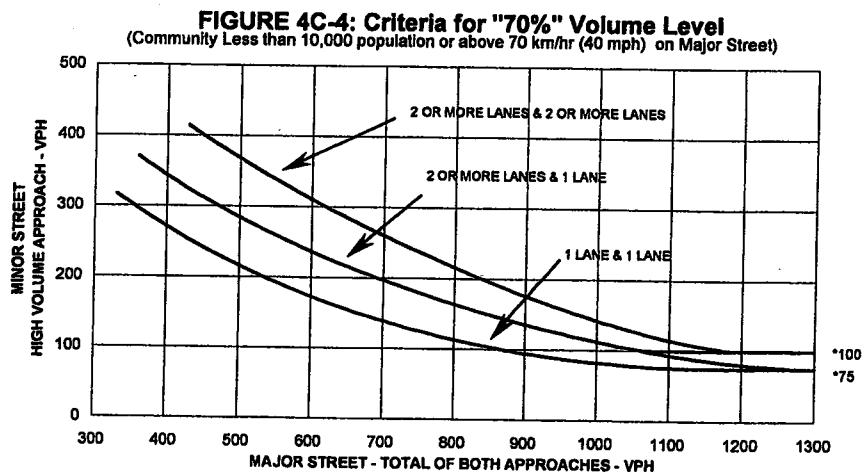
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sil  
Date: 12/29/08  
Major Street: Frontage Rd  
Minor Street: W 4th  
Lanes: 3  
Lanes: 3  
Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7 <sup>00</sup>	61			
	9 <sup>00</sup>	70			
	15 <sup>00</sup>	60			
	17 <sup>00</sup>	60			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3 Critical Approach Speed: 30  
Lanes: 3

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

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## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/29/08  
Major Street: Albany Street Lanes: 3 Critical Approach Speed: 30  
Minor Street: Travelers Street Lanes: 2

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1216	1283	1278	1108	1203	1529	1239	1412
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	120	154	141	161	154	234	202	256

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1216	1283	1278	1108	1203	1529	1239	1412
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	120	154	141	161	154	234	202	256

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany St.  
Minor Street: Traveler St.

Engineer: A. Sin  
Date: 12/29/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

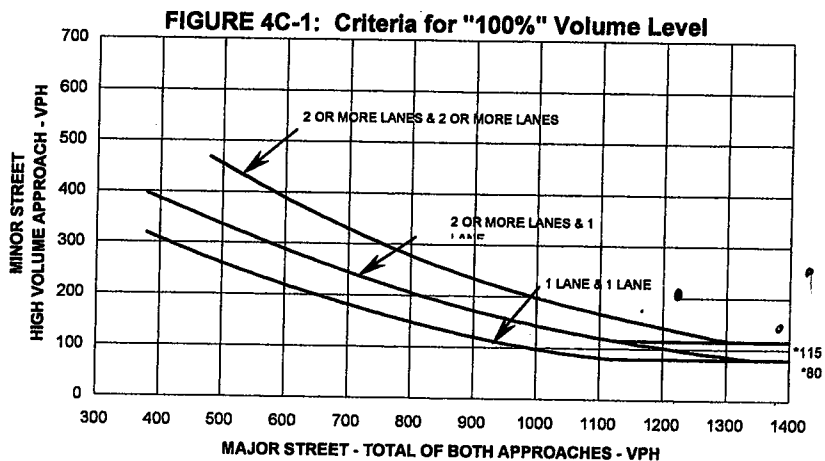
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

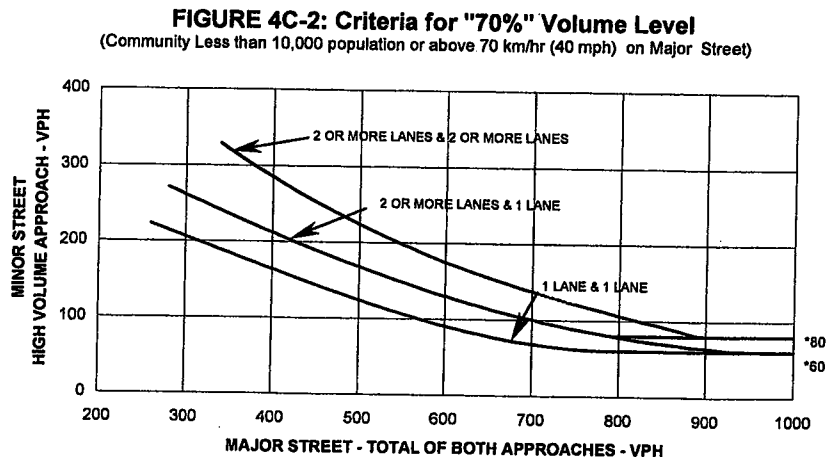
Plot four volume combinations on the applicable figure below.

\* All points above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	1383	154
15 <sup>00</sup>	1529	234
16 <sup>00</sup>	1239	202
17 <sup>00</sup>	1412	256



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany St.  
Minor Street: Traveler St.

Engineer: A. Siu  
Date: 12/29/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying  
use of warrant:

Record hour when criteria are fulfilled  
and the corresponding delay or volume  
in boxes provided.

Peak Hour		
15 <sup>00</sup>	15 <sup>29</sup>	23 <sup>39</sup>

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

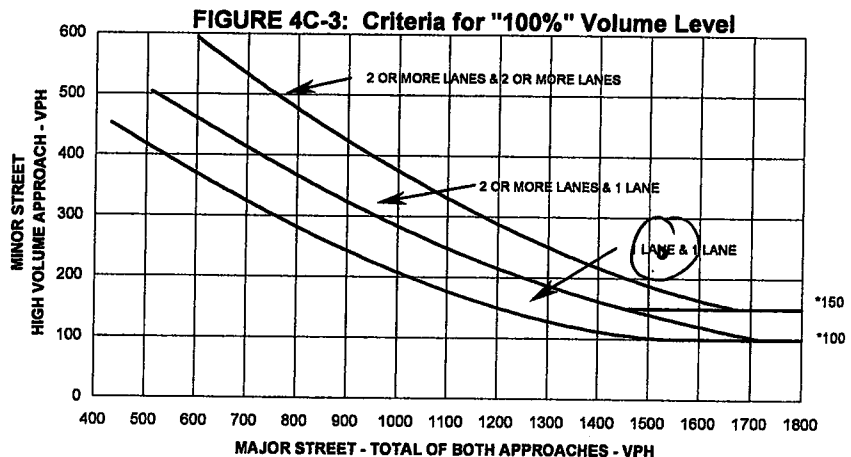
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

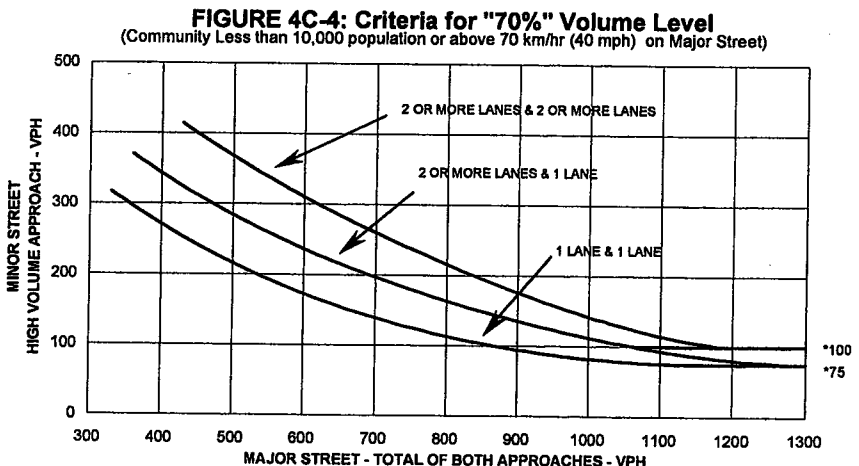
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/29/08  
Major Street: Albany St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: Traveler St. Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7 <sup>00</sup>	22			
	8 <sup>00</sup>	26			
	1 <sup>50</sup>	24			
	1 <sup>30</sup>	44			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Siu  
County: Suffolk Date: 12/29/08  
Major Street: Albany St. Lanes: 3 Critical Approach Speed: 30  
Minor Street: Traveler St. Lanes: 2

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria		Hour	Volume	Met?		Fulfilled?	
				Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 1, Condition B (80% satisfied)				<input checked="" type="checkbox"/>		
	Warrant 4, Pedestrian Volume at 80% of volume requirements:						
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.			Number of crashes per 12 months:		<u>3</u>		<input checked="" type="checkbox"/>

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria				Met?		Fulfilled?		
				Yes	No	Yes	No	
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: <u>1763</u>		<input checked="" type="checkbox"/>				
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant:	1	2	3	<input checked="" type="checkbox"/>		
		Satisfied?:	<u>Y</u>	<u>Y</u>	<u>Y</u>	<input checked="" type="checkbox"/>		
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		<u>NO</u>	<u>DATA</u>	← Hour				
				← Volume				

Characteristics of Major Routes		Met?		Fulfilled?	
		Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:			<input checked="" type="checkbox"/>	
	Minor Street:				
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:				
	Minor Street:				
3. Appears as a major route on an official plan.	Major Street:				
	Minor Street:				

### CONCLUSIONS

Warrants Satisfied:

Remarks: \_\_\_\_\_  
\_\_\_\_\_

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# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany Street  
Minor Street: Herald Street

Engineer: A. Sil  
Date: 12/29/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	70%	2 or more	70%								
Approach Lanes	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1121	1154	1045	932	1036	1315	1033	927
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	792	718	791	879	1075	1307	1254	1103

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	70%	2 or more	70%								
Approach Lanes	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1121	1154	1045	932	1036	1315	1033	927
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	792	718	791	879	1075	1307	1254	1103

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany St.  
Minor Street: Herald St.

Engineer: A. Sin  
Date: 12/29/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

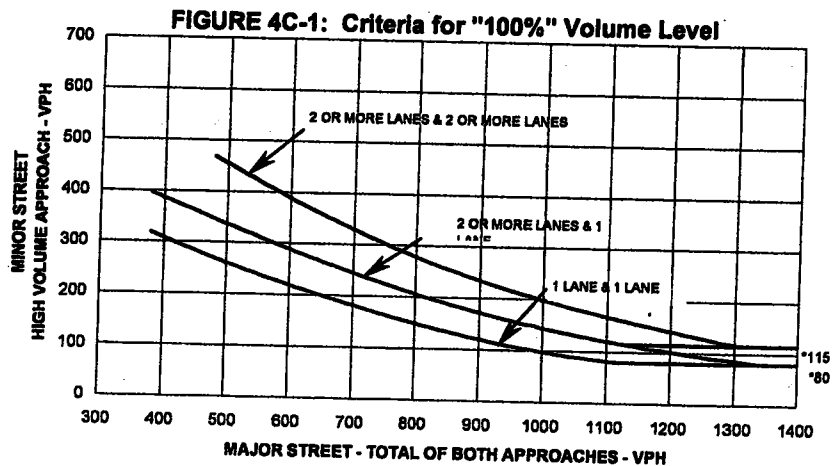
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

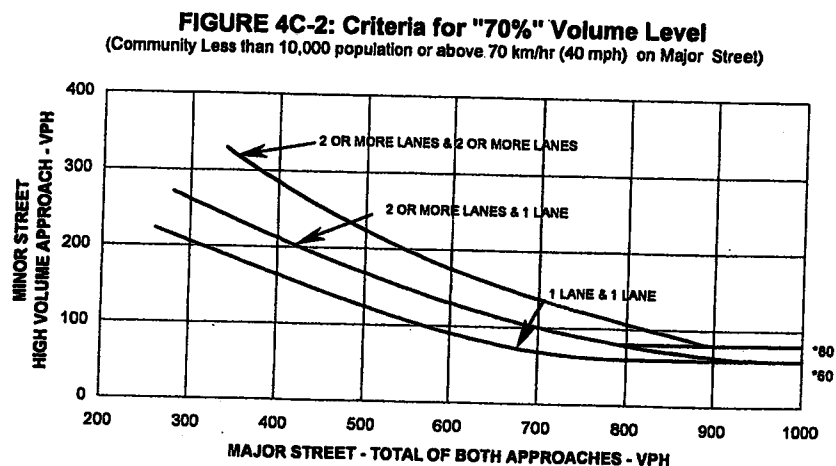
Plot four volume combinations on the applicable figure below.

\* All points above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
1400	1036	1075
1500	1315	1307
1600	1033	1254
1700	927	1103



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A.S.W.  
Date: 12/19/08

Major Street: Albany St.  
Minor Street: Herald St.

Lanes: 3  
Lanes: 2

Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1500	1315	1307

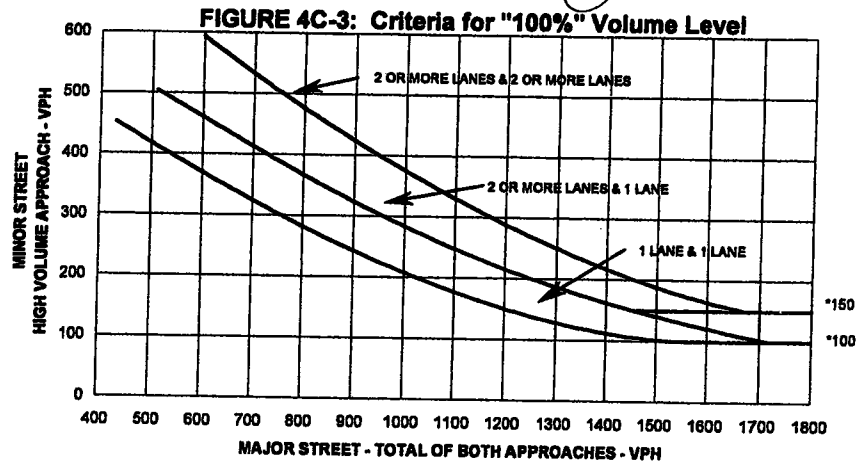
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

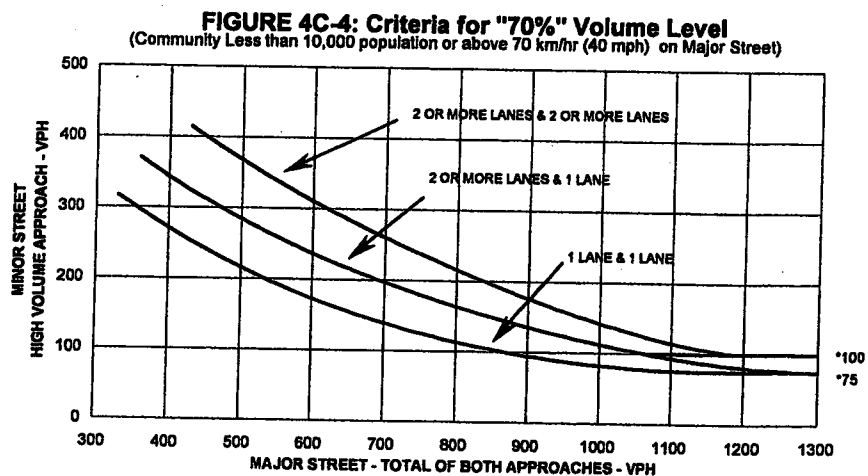
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sullivan  
Date: 12/29/08

Major Street: Albany St.  
Minor Street: Harvard St.

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	900	5			
	1100	13			
	1300	5			
	1400	11			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.		
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		



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# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany St. SB / Frontage  
Minor Street: Albany St. NEB

Engineer: A. Sim  
Date: 2/12/09  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		800	900	1000	1100	1200	1300	1400	1500
	100%	70%	100%	70%								
Approach Lanes	1		2 or more		800	900	1000	1100	1200	1300	1400	1500
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	769	815	727	676	724	999	921	816
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	400	521	416	381	521	713	807	742

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1300	1400
	100%	70%	100%	70%								
Approach Lanes	1		2 or more		700	800	900	1000	1100	1200	1300	1400
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	769	815	727	676	724	999	921	816
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	400	521	416	381	521	713	807	742

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany SB / Frontage  
Minor Street: Albany NEB

Engineer: A. Sin  
Date: 2/12/09  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

☐ 70% ☒ 100%

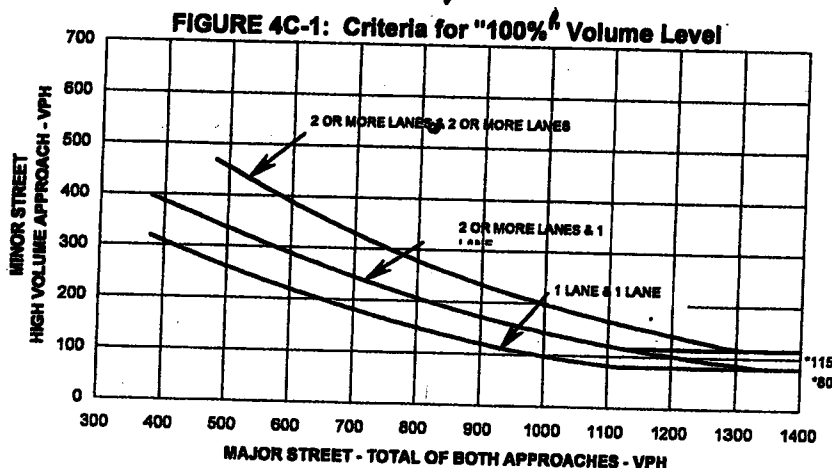
## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

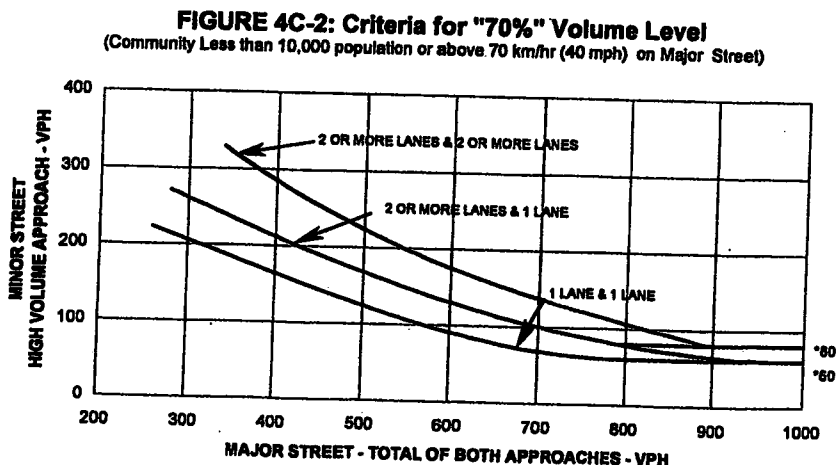
Plot four volume combinations on the applicable figure below.

\* All points above line



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	815	521
15 <sup>00</sup>	999	713
16 <sup>00</sup>	921	807
17 <sup>00</sup>	816	742



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



# TRAFFIC SIGNAL WARRANT SUMMARY

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TRAFFIC ENGINEERING - 07/99  
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City: Boston  
County: Suffolk  
Major Street: Albany SB / Frontage  
Minor Street: Albany NEB

Engineer: A. S. I. U.  
Date: 2/12/09  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1600	921	807

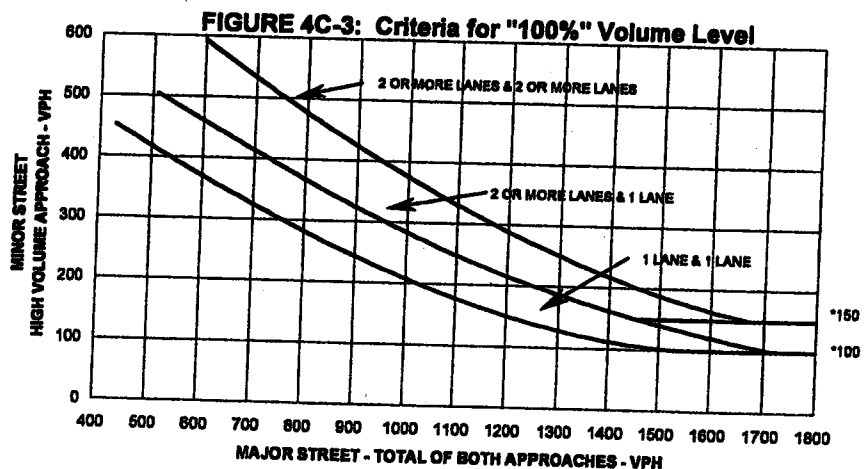
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

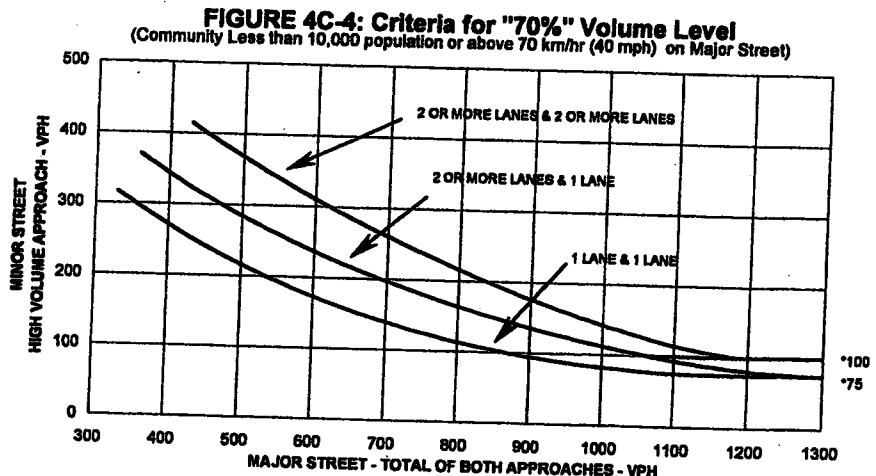
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		807
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1749	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Albany ST / Frontage  
Minor Street: Albany IN VER

Engineer: A. Siu  
Date: 2/12/09  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7 <sup>00</sup> 8 <sup>00</sup> 9 <sup>00</sup> 10 <sup>00</sup>	20 26 20 6			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

## WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students: <input type="text"/>	Hour: <input type="text"/>
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes: <input type="text"/>	Gaps: <input type="text"/>
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

## WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston Engineer: A. Sim  
County: Suffolk Date: 12/30/08  
Major Street: I-93 SB off Ramp Lanes: 2 Critical Approach Speed: 30  
Minor Street: Frontage Rd Lanes: 2

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1300	1400	1500	1600
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1547	1498	1417	1316	1165	1383	1326	1306
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	356	266	271	321	330	452	451	377

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☒ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1300	1400	1500	1600
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1547	1498	1417	1316	1165	1383	1326	1306
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	356	266	271	321	330	452	451	377

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/30/08

Major Street: I-93 SB Ramps  
Minor Street: Frontage Rd

Lanes: 2  
Lanes: 2

Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

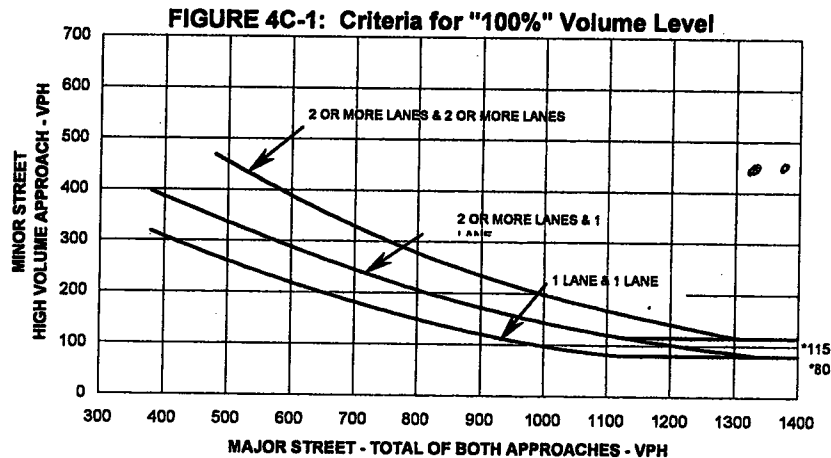
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Plot four volume combinations on the applicable figure below.

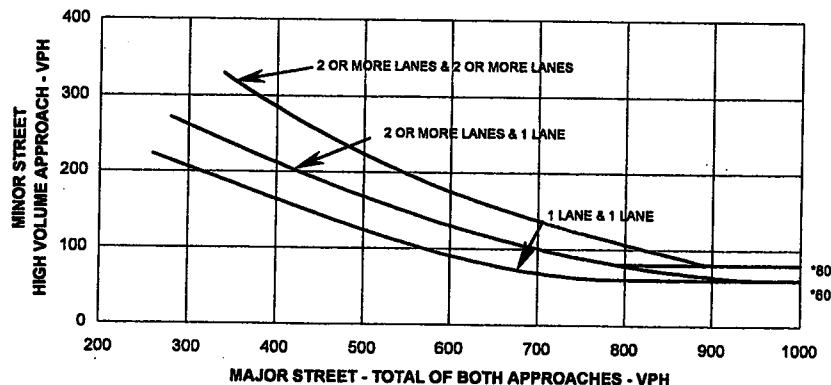
\* All points  
above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
7 <sup>00</sup>	1547	356
8 <sup>00</sup>	1498	266
14 <sup>00</sup>	1383	452
15 <sup>00</sup>	1326	451



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

**FIGURE 4C-2: Criteria for "70%" Volume Level**  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Siu  
Date: 12/30/08

Major Street: 1-93 SB Ramps  
Minor Street: Frontage Rd

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.		0			
		0			
		0			
		0			X
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					X
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 12/30/08  
Major Street: I-93 SB Ramps  
Minor Street: Frontage Rd  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
700	1547	356

#### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

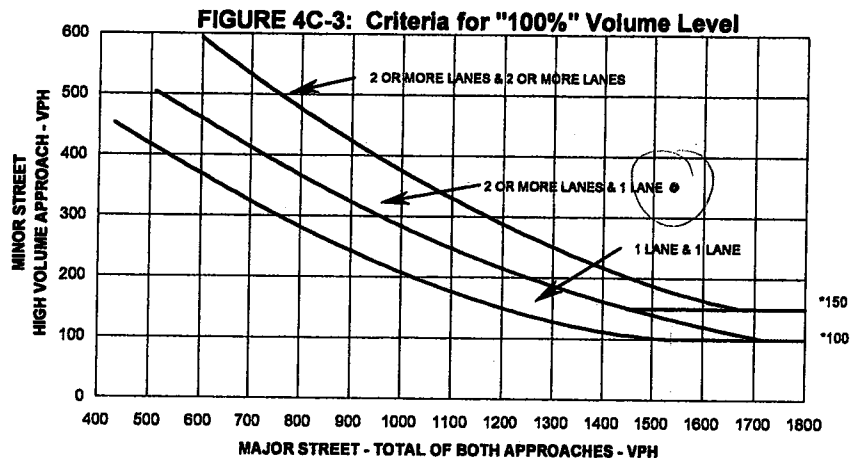
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		356
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

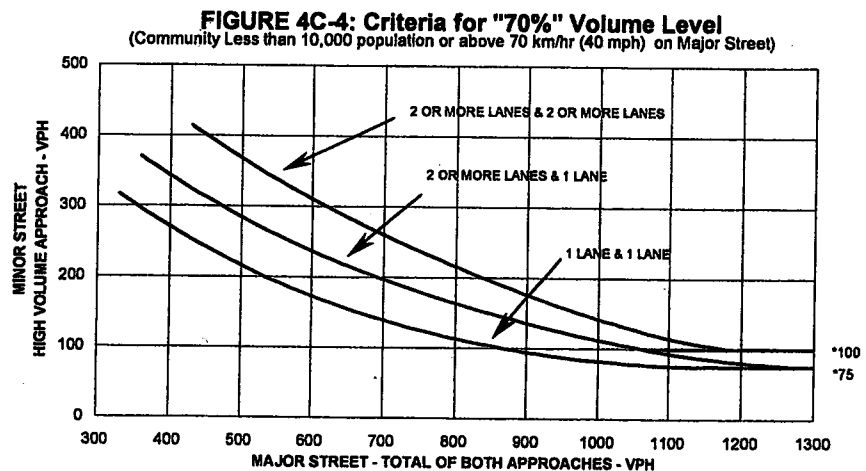
#### 3. Total Entering Volume (vehicles per hour)

No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1903	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2



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# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sim  
Date: 1/30/09

Major Street: Martha Road  
Minor Street: Nashua Street

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	2 or more										
Approach Lanes	100%	70%	100%	70%								
Volume Level												
Both Approaches on Major Street	500 (400)	350	800 (480)	420	548	756	612	475	441	405	478	569
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	269	421	412	329	273	340	347	620

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☐ Yes ☒ No  
80% Satisfied: ☐ Yes ☒ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	10 <sup>00</sup>	11 <sup>00</sup>	14 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	2 or more										
Approach Lanes	100%	70%	100%	70%								
Volume Level												
Both Approaches on Major Street	750 (600)	525	900 (720)	630	548	756	612	475	441	405	478	569
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	269	421	412	329	273	340	347	620

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. SIA  
Date: 12/29/08

Major Street: Frontage Rd  
Minor Street: W. 4th

Lanes: 3  
Lanes: 3  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

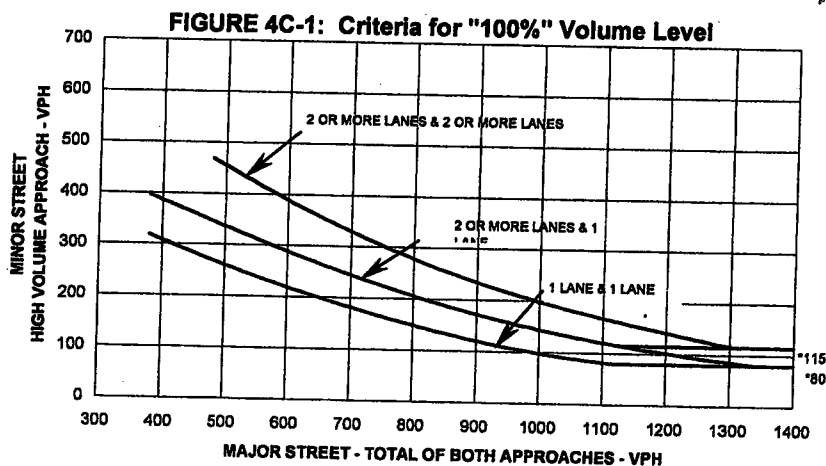
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

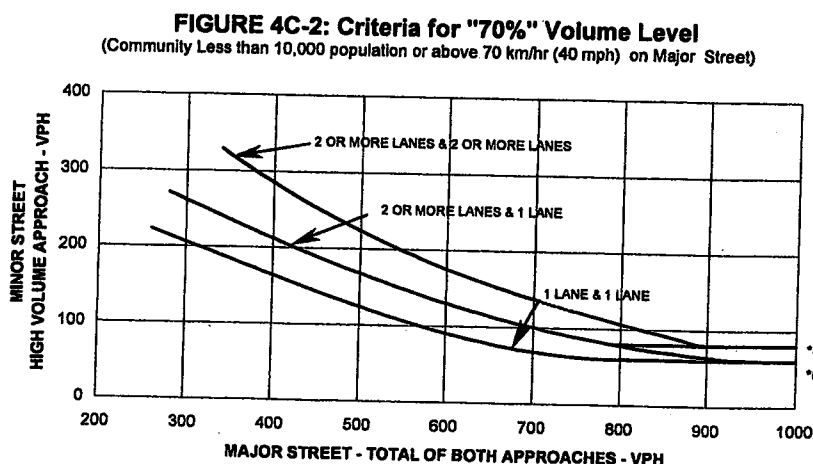
Plot four volume combinations on the applicable figure below.

\*All points  
above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
700	1289	912
800	1400	972
1500	1427	633
1700	1294	834



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Sim  
Date: 1/30/09  
Major Street: Martha Road  
Minor Street: Nashua Street  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

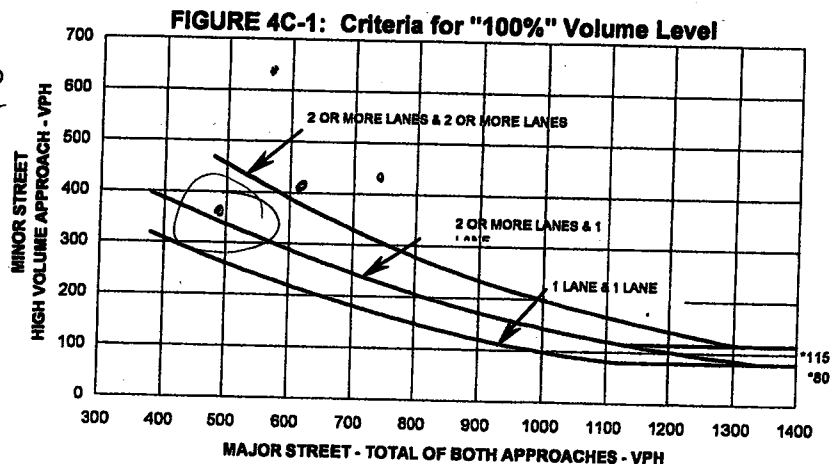
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

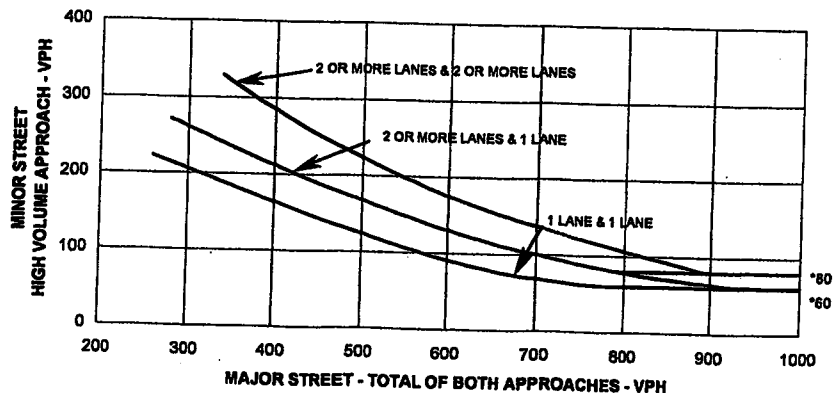
\*all but one point above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
8 <sup>00</sup>	756	421
9 <sup>00</sup>	612	412
16 <sup>00</sup>	478	347
17 <sup>00</sup>	569	620



\*Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

**FIGURE 4C-2: Criteria for "70%" Volume Level**  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\*Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Martha Road  
Minor Street: Nashua St.

Engineer: A. Sullivan  
Date: 1/30/09  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1700	1569	626

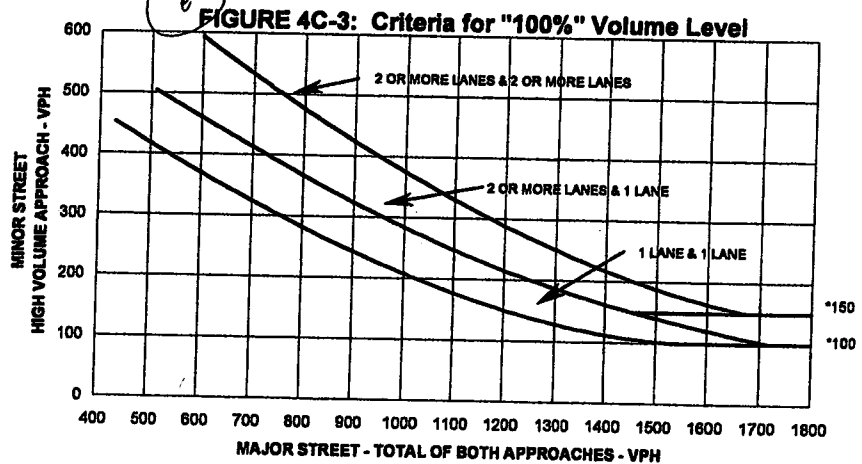
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

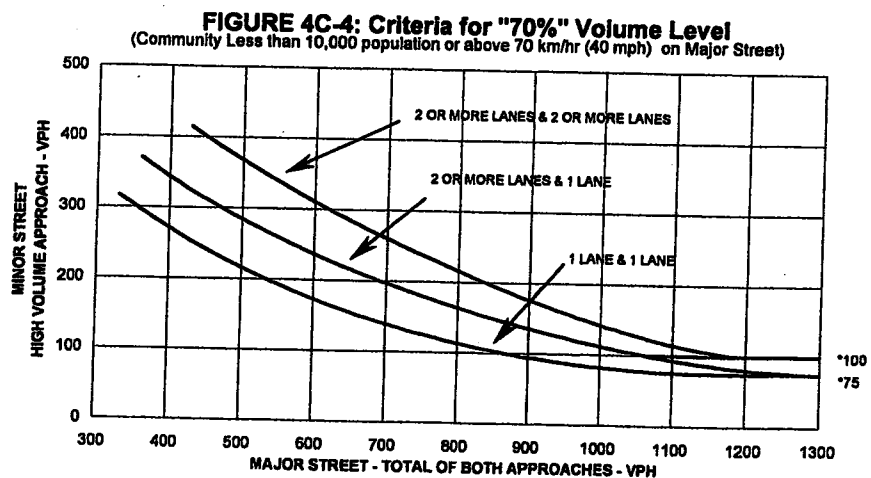
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		626
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1189	
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sullivan  
Date: 1/30/09

Major Street: Martha Rd  
Minor Street: Nashua St.

Lanes: 2 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

*pending gap study*

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8 <sup>00</sup>	110		X	
	15 <sup>00</sup>	107			
	16 <sup>00</sup>	213			
	17 <sup>00</sup>	214			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☐ No

Criteria		Fulfilled?	
		Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.			
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.			

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 1/30/09  
Major Street: Martha Rd  
Minor Street: Nashua St.  
Lanes: 2  
Lanes: 2  
Critical Approach Speed: 30

### WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Volume	Met?		Fulfilled?	
			Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)					
	Warrant 1, Condition B (80% satisfied)					
	Warrant 4, Pedestrian Volume at 80% of volume requirements:					
	80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour					
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:					
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.	Number of crashes per 12 months:					

### WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Criteria	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.	Entering Volume: <u>1189</u>		
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant: <u>1</u> <u>2</u> <u>3</u> Satisfied?: <u>N</u> <u>N</u> <u>Y</u>		
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	<u>NO</u>	<u>DATA</u>	← Hour	
			← Volume	

Characteristics of Major Routes	Met?		Fulfilled?	
	Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street: <input checked="" type="checkbox"/>			
2. Rural or suburban highway outside of, entering, or traversing a city.	Minor Street: <input checked="" type="checkbox"/>			
	Major Street: <input type="checkbox"/>			
3. Appears as a major route on an official plan.	Minor Street: <input type="checkbox"/>			
	Major Street: <input checked="" type="checkbox"/>			
	Minor Street: <input checked="" type="checkbox"/>			

### CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: \_\_\_\_\_  
\_\_\_\_\_

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# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Silu  
Date: 1/8/09  
Major Street: Rutherford Ave  
Minor Street: Chelsea St  
Lanes: 4  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1		2 or more									
	Volume Level		100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	2743	3127	2680	2132	2526	2716	2783	3032
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	886	1058	741	733	726	808	997	1079

Record 8 highest hours and the corresponding volumes in boxes provided.

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	13 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	100%	70%	100%	70%								
Approach Lanes	1		2 or more									
Both Approaches on Major Street	750 (600)	525	900 (720)	630	2743	3127	2680	2132	2526	2716	2783	3032
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	886	1058	741	733	726	808	997	1079

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Rutherford Ave  
Minor Street: Chelsea St

Engineer: A. SIA  
Date: 1/8/09  
Lanes: 4  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

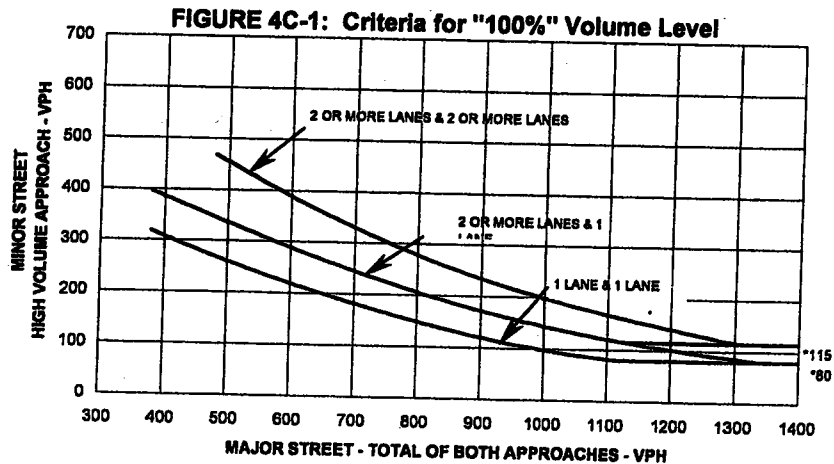
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

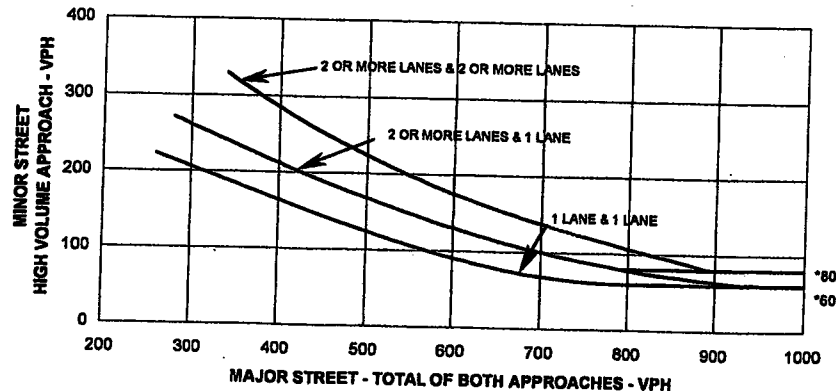
Plot four volume combinations on the applicable figure below.

\* All points  
above line



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

**FIGURE 4C-2: Criteria for "70%" Volume Level**  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
7 <sup>00</sup>	2743	886
8 <sup>00</sup>	3127	1058
16 <sup>00</sup>	2783	997
17 <sup>00</sup>	3032	1079



# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sullivan  
Date: 1/8/09

Major Street: Rutherford Ave  
Minor Street: Chelsea St.

Lanes: 4  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Plot volume combination on the applicable figure below.

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

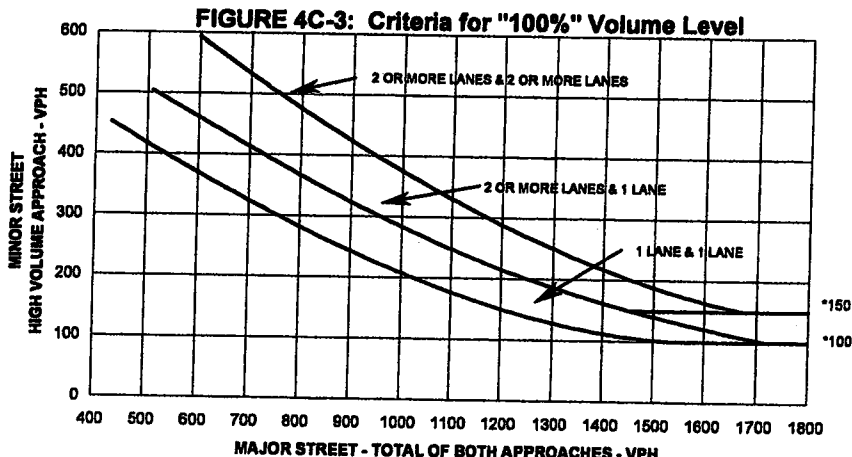
Peak Hour		
800	1312A	1058

### Criteria

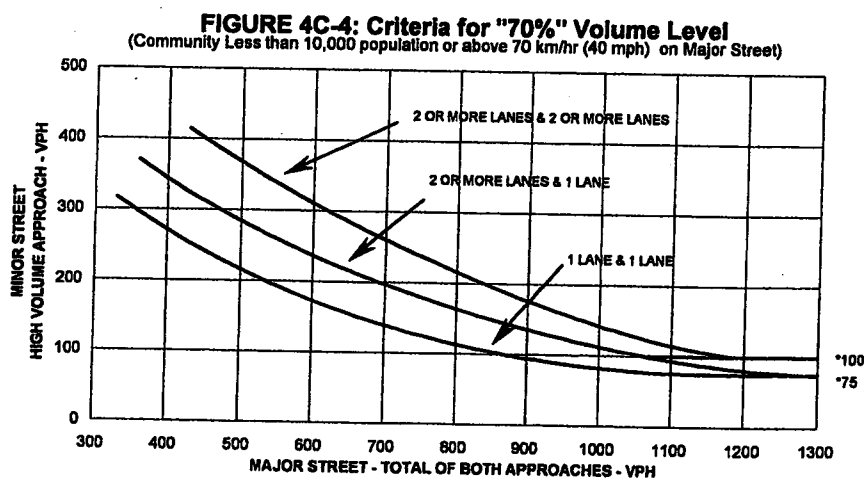
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		1058
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	418	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Rutherford Ave  
Minor Street: Chelsea St.

Engineer: A. Sullivan  
Date: 1/9/09  
Lanes: 4  
Lanes: 2 Critical Approach Speed: 30

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	8:00	49			
	14:00	36			
	15:00	40			
	17:00	63			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 4 Critical Approach Speed: 30  
Lanes: 2

68

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Major Street: Rutherford Ave  
Minor Street: RT 1 Ramps

Engineer: A. Sim  
Date: 12/30/08  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

### WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

#### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	70%	2 or more	70%								
Approach Lanes	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	2244	2503	2351	2699	3184	3430	3806	3681
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	760	890	837	307	395	369	411	464

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

#### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☐ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					7 <sup>00</sup>	8 <sup>00</sup>	9 <sup>00</sup>	12 <sup>00</sup>	14 <sup>00</sup>	15 <sup>00</sup>	16 <sup>00</sup>	17 <sup>00</sup>
	1	70%	2 or more	70%								
Approach Lanes	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	2244	2503	2351	2699	3184	3430	3806	3681
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	760	890	837	307	395	369	411	464

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

### WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. SIA  
Date: 12/30/08

Major Street: Rutherford Ave  
Minor Street: RT 1 Ramps

Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

### Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

☐ 70% ☒ 100%

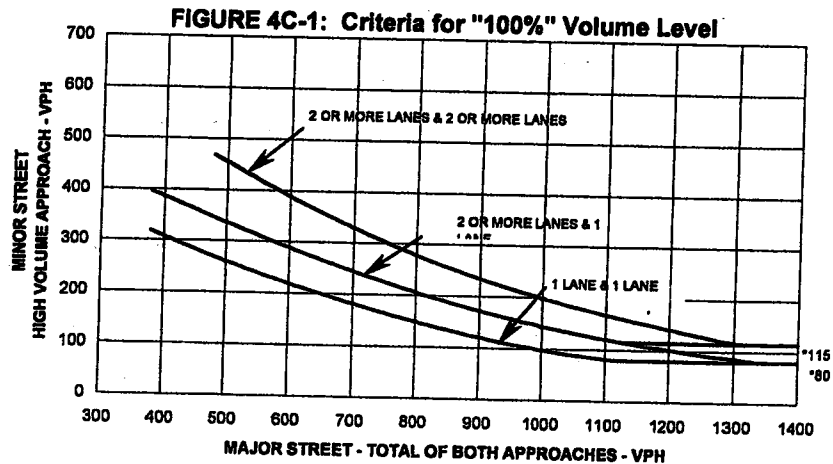
### WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

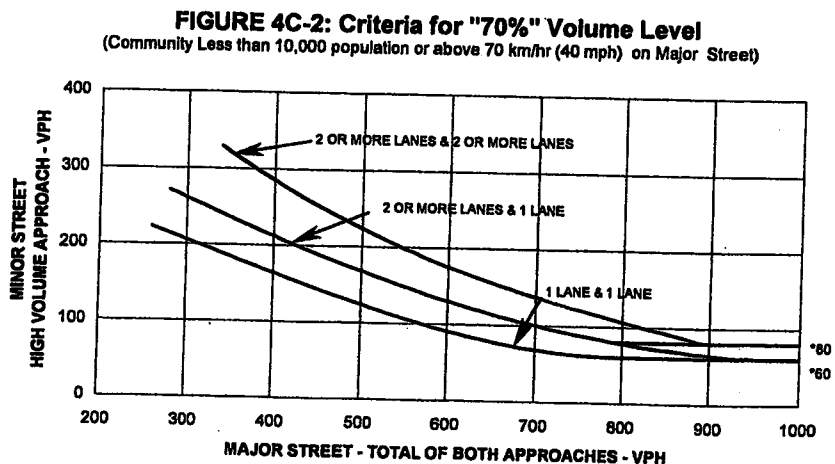
Plot four volume combinations on the applicable figure below.

\* All points  
above line



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

Four Highest Hours	Volumes	
	Major Street	Minor Street
1400	3184	395
1500	3430	369
1600	3806	411
1700	3681	464



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Silva  
Date: 12/30/08

Major Street: Rutherford Ave  
Minor Street: Rt 1 Ramps

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ?
2. Is the intersection in a built-up area of isolated community of <10,000 population?

☐ Yes ☒ No  
☐ Yes ☒ No  
☐ 70% ☒ 100%

If Question 1 or 2 above is answered "Yes", then use "70%" volume level

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1600	2806	411

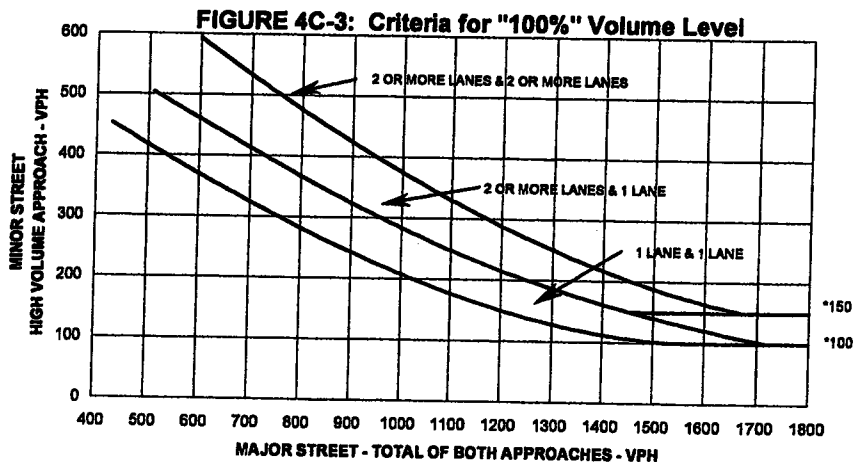
### Criteria

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

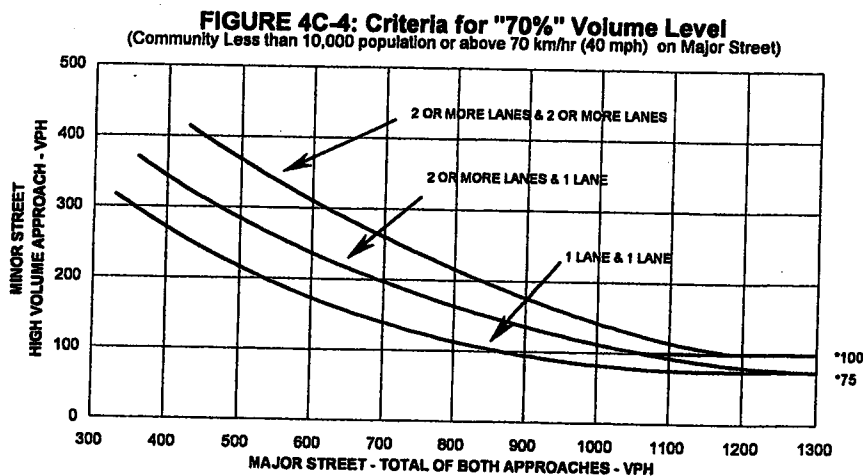
2. Volume on Minor Approach (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sullivan  
Date: 12/30/08

Major Street: Rutherford Ave  
Minor Street: Rt 1 Ramps

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		





# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Silu  
Date: 2/12/09  
Major Street: Frontage Road NB  
Minor Street: Frontage Extension  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No  
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No  
If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.  
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

### Condition A - Minimum Vehicular Volume

100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1300	1400
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1126	1254	1077	927	918	1037	934	924
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	517	616	571	497	665	859	960	904

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

### Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ☒ Yes ☐ No  
Excessive Delay: ☒ Yes ☐ No  
100% Satisfied: ☒ Yes ☐ No  
80% Satisfied: ☒ Yes ☐ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
	1		2 or more		700	800	900	1000	1100	1200	1300	1400
	100%	70%	100%	70%								
Approach Lanes												
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1126	1254	1077	927	918	1037	934	924
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	517	616	571	497	665	859	960	904

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Delay is not excessive.

Not Applicable: ☐

## WARRANT 3 - PEAK HOUR

This signal warrant shall be applied only in unusual cases. Such cases include manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Not Applicable: ☐

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sin  
Date: 2/12/09

Major Street: Frontage NB  
Minor Street: Frontage Ext.

Lanes: 3  
Lanes: 2 Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ☒ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

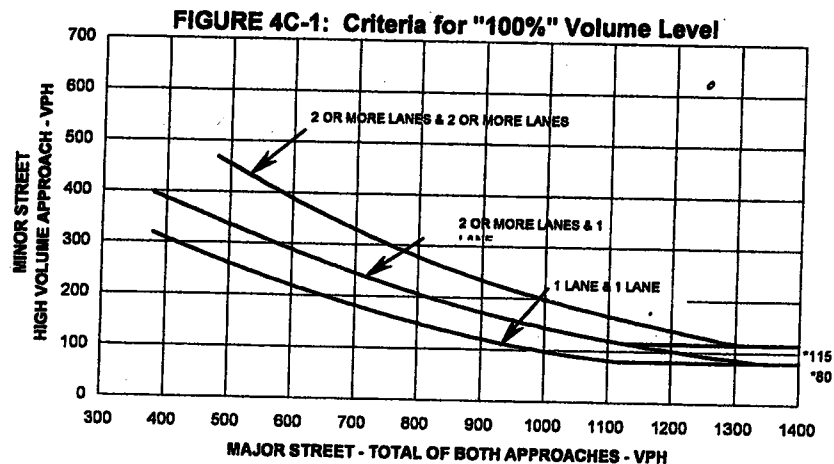
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☐ No

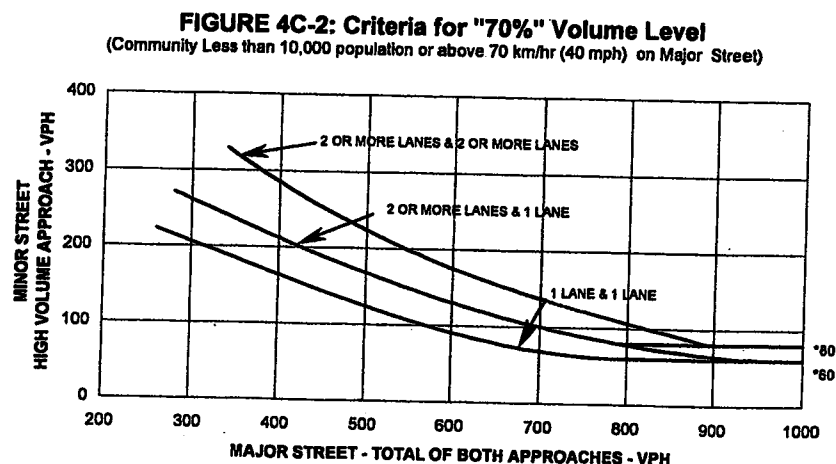
Plot four volume combinations on the applicable figure below.

\* All points  
above line

Four Highest Hours	Volumes	
	Major Street	Minor Street
800	1254	616
1500	1037	859
1600	934	960
1700	924	904



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

# TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk  
Engineer: A. Siu  
Date: 2/12/09  
Major Street: Frontage NB  
Minor Street: Frontage Ext.  
Lanes: 3  
Lanes: 2  
Critical Approach Speed: 30

## Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph)? ☐ Yes ☒ No
  2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ☒ No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ☒ 100%

## WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: ☒ Yes ☐ No  
Satisfied: ☒ Yes ☐ No

Unusual condition justifying use of warrant:

Plot volume combination on the applicable figure below.

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
1500	1039	859

### Criteria

#### 1. Delay on Minor Approach (vehicle-hours)

Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

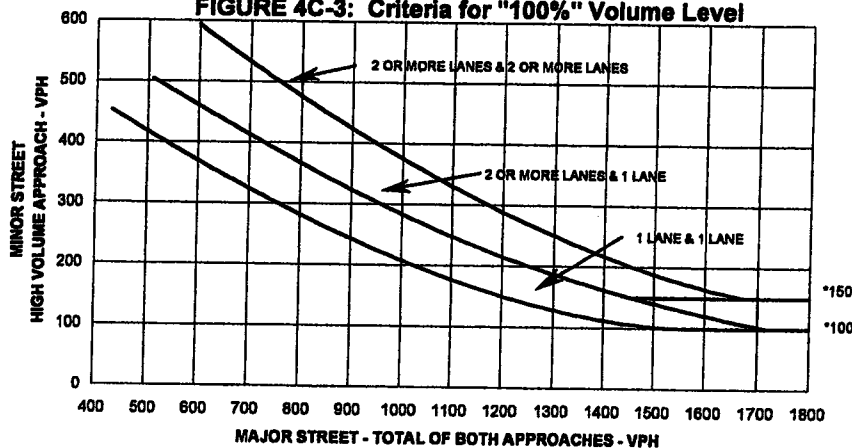
#### 2. Volume on Minor Approach (vehicles per hour)

Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

#### 3. Total Entering Volume (vehicles per hour)

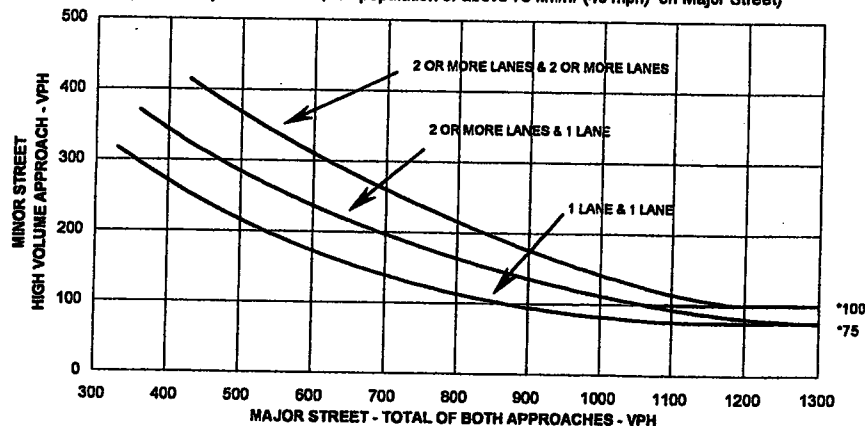
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

FIGURE 4C-3: Criteria for "100%" Volume Level



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-4: Criteria for "70%" Volume Level  
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

## TRAFFIC SIGNAL WARRANT SUMMARY

City: Boston  
County: Suffolk

Engineer: A. Sullivan  
Date: 2/12/09

Major Street: Frontage NB  
Minor Street: Frontage Ext.

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

### WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: ☒ Yes ☐ No  
Satisfied: ☐ Yes ☒ No

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled?	
				Yes	No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	7:00	26			
	8:00	29			
	9:00	39			
	10:00	10			
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.					
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.					

### WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	Minutes:	Gaps:
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.		

### WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: ☐ Yes ☒ No  
Satisfied: ☐ Yes ☒ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

Lanes: 3 Critical Approach Speed: 30  
Lanes: 2

## Appendix C. Existing Conditions Operations Schedules

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# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Pearl Street and Atlantic Avenue

DATE: \_\_\_\_\_

INTERSECTION No.: 4102

DATE FIRST IN SERVICE: \_\_\_\_\_

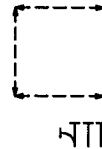
SECTION No.: 13

### EXISTING CONDITIONS

#### CLEARANCE TABLE

		TO					
		G	R	-	-	W	DW
FROM	G	G	Y	-	-	-	-
	R	-	R	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	W	-	-	-	-	W	FDW
	DW	-	-	-	-	-	DW

FLASH  
OPERATION



STREET	DIR	FACE	Ø1			Ø2*									
ATLANTIC AVE.	NB	-	G	Y	R	R	R	R							FY
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW							OFF

#### TIMING IN SECONDS

MINIMUM GREEN	25			-											
EXTENSION	2			-											
MAXIMUM #1/#2 GREEN	-/-			-											
YELLOW CLEARANCE		3													
RED CLEARANCE			1			4									
WALK INTERVAL				8											
PEDESTRIAN CLEARANCE					4										
MEMORY	-			-											
RECALL	MAX			OFF											

\*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

#### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2			HOURS OF OPERATION
1	80	3	64	16			-
2	100	15	84	16			-
3	100	71	84	16			-
FLASH OPERATION		-	-	-			-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Pearl Street and Purchase Street

DATE: \_\_\_\_\_

INTERSECTION No.: 602

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

### EXISTING CONDITIONS

CLEARANCE TABLE											FLASH OPERATION			
FROM		TO												
		G	R	-	-	W	DW							
		G	G	Y	-	-	-							-
		R	-	R	-	-	-							-
-	-	-	-	-	-	-	-							
W	-	-	-	-	-	W	FDW							
DW	-	-	-	-	-	-	DW							
STREET		DIR	FACE		Ø1			Ø2*			Ø5			
PEARL ST.		WB	-		R	R	R	R	R	R	G	Y	R	FR
PURCHASE ST.		SB	-		G	Y	R	R	R	R	R	R	R	FY
CROSSWALK		-	-		W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW	OFF
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW	OFF
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	DW	DW	DW	OFF
TIMING IN SECONDS														
MINIMUM GREEN					8			-			8			
EXTENSION					2			-			2			
MAXIMUM #1/#2 GREEN					-/-			-			-/-			
YELLOW CLEARANCE						3						3		
RED CLEARANCE							1			4			1	
WALK INTERVAL					8			8			8			
PEDESTRIAN CLEARANCE					10				17		10			
MEMORY					-			-			-			
RECALL					MAX			OFF			OFF			
*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED. MAX. #2 DURING COORDINATED OPERATION														
COORDINATION INFORMATION (TIMES IN SECONDS)														
CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	HOURS OF OPERATION								
1	90	22	27	29	34	-								
2	100	36	38	29	33	-								
3	100	14	36	29	35	-								
FLASH OPERATION		-	-	-	-	-								



## OPERATION SCHEDULE

DATE:

DATE FIRST IN SERVICE:

## EXISTING CONDITIONS

CLEARANCE TABLE																							FLASH OPERATION			
FROM		TO																								
		G	R	-	-	W	DW																			
		G	G	Y	-	-	-																			-
		R	-	R	-	-	-																			-
		-	-	-	-	-	-																			-
-	-	-	-	-	-	-	-																			
-	-	-	-	-	-	-	-																			
-	-	-	-	-	-	-	-																			
W	-	-	-	-	-	W	FDW																			
DW	-	-	-	-	-	-	DW																			
STREET			DIR	FACE				Ø1			Ø2*			Ø5			Ø6									
OLIVER STREET			EB	-				R	R	R	R	R	R	G	Y	R	G	Y	R	FR						
OLIVER STREET			EB	-				R	R	R	R	R	R	GL	YL	R	G	Y	R	FR						
SEAPORT BLVD			WB	-				R	R	R	R	R	R	R	R	R	G	Y	R	FR						
ATLANTIC AVE			NB	-				G	Y	R	R	R	R	R	R	R	R	R	R	FY						
CROSSWALK			-	-				W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF					
CROSSWALK			-	-				DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW	W/ FDW	DW	DW	DW	OFF					
CROSSWALK			-	-				DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF					
TIMING IN SECONDS																										
MINIMUM GREEN								10			-			4			8									
EXTENSION								2			-			2			2									
MAXIMUM #1/#2 GREEN								-/-			-			-/-			-/-									
YELLOW CLEARANCE									3						3			3								
RED CLEARANCE										1			1			1			1							
WALK INTERVAL											8			8			8									
PEDESTRIAN CLEARANCE												10		5			5									
MEMORY								-			-			-			-									
RECALL								MAX			OFF			OFF			OFF									
*Ø2 PUSH-BUTTON ACTUATED ONLY MAX. #2 DURING COORDINATED OPERATION																										
COORDINATION INFORMATION (TIMES IN SECONDS)																										
CYCLE	CYCLE LENGTH			OFFSET	Ø1	Ø2	Ø5	Ø5	HOURS OF OPERATION																	
1	90			23	28	21	17	24	-																	
2	100			33	31	21	24	24	-																	
3	100			0	37	21	8	34	-																	
FLASH OPERATION				-	-	-	-	-	-																	

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Oliver Street and Purchase Street

DATE: \_\_\_\_\_

INTERSECTION No.: 558

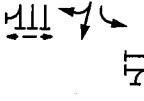
DATE FIRST IN SERVICE: \_\_\_\_\_

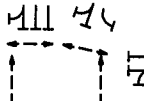
SECTION No.: 13

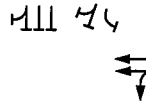
### EXISTING CONDITIONS

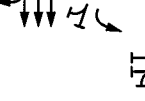
#### CLEARANCE TABLE

		TO					
		G	R	-	-	W	DW
FROM	G	G	Y	-	-	-	-
	R	-	R	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	W	-	-	-	-	W	FDW
	DW	-	-	-	-	-	DW









FLASH  
OPERATION

STREET	DIR	FACE	Ø1			Ø2*			Ø5			Ø6			
OLIVER STREET	WB	-	R	R	R	R	R	R	G	Y	R	R	R	R	FR
PURCHASE ST	SB	-	R	R	R	R	R	R	R	R	R	G	Y	R	FR
RAMP CS-P	SB	-	G	Y	R	R	R	R	R	R	R	R	R	R	FY
RAMP CS-P	SB	-	GR	YR	R	R	R	R	R	R	R	GR	YR	R	FY
CROSSWALK	-	-	W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF

#### TIMING IN SECONDS

MINIMUM GREEN	8			-			8			8		
EXTENSION	2			-			2			2		
MAXIMUM #1/#2 GREEN	-/-			-			-/-			-/-		
YELLOW CLEARANCE		3						3			3	
RED CLEARANCE			1			1			1			1
WALK INTERVAL	8			8								
PEDESTRIAN CLEARANCE	6				7							
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			OFF		

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

#### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	Ø6	HOURS OF OPERATION
1	90	77	24	16	17	33	-
2	100	74	41	16	17	26	-
3	100	61	20	16	17	47	-
FLASH OPERATION		-	-	-	-	-	-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: High Street and Atlantic Avenue

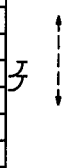
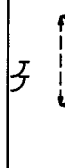
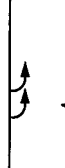
DATE: \_\_\_\_\_

INTERSECTION No.: 1486

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

### EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	R	-	-	-													
		-	-	-	-	-	-													
-	-	-	-	-	-	-														
W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	DW														
STREET		DIR	FACE		Ø1			Ø2*			Ø5									
HIGH STREET		EB	-		R	R	R	R	R	R	GL	YL	R				FR			
ATLANTIC AVE		NB	-		G	Y	R	R	R	R	R	R	R				FY			
CROSSWALK		-	-		W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW				OFF			
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW				OFF			
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF			

TIMING IN SECONDS												
MINIMUM GREEN	8			-			8					
EXTENSION	2			-			2					
MAXIMUM #1/#2 GREEN	-/-			-			-/-					
YELLOW CLEARANCE		3						3				
RED CLEARANCE			1			1			1			
WALK INTERVAL	7			7			7					
PEDESTRIAN CLEARANCE	8				8		8					
MEMORY	-			-			-					
RECALL	MAX			OFF			OFF					

\*Ø2 PED RECALL FROM 7AM - 10PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

COORDINATION INFORMATION (TIMES IN SECONDS)							
CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5		HOURS OF OPERATION
1	90	50	49	16	25		-
2	90	50	49	16	25		-
3	100	0	59	16	25		-
FLASH OPERATION		-	-	-	-		-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: High Street and Purchase Street


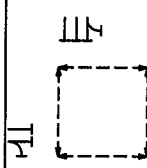
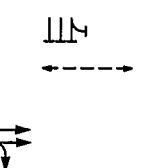
DATE: \_\_\_\_\_

INTERSECTION No.: 7004

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

### EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION	
		TO																			
		G	R	-	-	W	DW														
FROM	G	G	Y	-	-	-	-														
	R	-	R	-	-	-	-														
	-	-	-	-	-	-	-														
	-	-	-	-	-	-	-														
	W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	-	DW														
STREET		DIR	FACE					Ø1			Ø2*			Ø5							
HIGH STREET		EB	-					R	R	R	R	R	R	G	Y	R					FR
PURCHASE ST		SB	-					G	Y	R	R	R	R	R	R	R					FY
CROSSWALK		-	-					W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW					OFF
CROSSWALK		-	-					DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW					OFF
CROSSWALK		-	-					DW	DW	DW	W	FDW	DW	DW	DW	DW					OFF

### TIMING IN SECONDS

MINIMUM GREEN	8			-			8										
EXTENSION	2			-			2										
MAXIMUM #1/#2 GREEN	-/-			-			-/-										
YELLOW CLEARANCE		3						3									
RED CLEARANCE			1				1			1							
WALK INTERVAL	8			8			8			8							
PEDESTRIAN CLEARANCE	8				11		8										
MEMORY	-			-			-										
RECALL	MAX			OFF			OFF										

\*Ø2 PED RECALL FROM 7AM - 10PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	HOURS OF OPERATION	
1	90	79	45	20	25	-	
2	90	40	45	20	25	-	
3	100	92	50	20	30	-	
FLASH OPERATION		-	-	-	-	-	

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Broad Street and Surface Road

DATE: \_\_\_\_\_

INTERSECTION No.: 4104

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

### EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	Y	-	-	-													
		-	-	-	-	-	-													
-	-	-	-	-	-	-														
W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	DW														
STREET		DIR	FACE		Ø1			Ø2*			Ø5									
BROAD STREET		EB	-		R	R	R	R	R	R	G	Y	R				FR			
SURFACE ROAD		SB	-		G	Y	R	R	R	R	R	R	R				FY			
CROSSWALK		-	-		W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW				OFF			
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW				OFF			
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF			

### TIMING IN SECONDS

MINIMUM GREEN	8			-			8						
EXTENSION	2			-			2						
MAXIMUM #1/#2 GREEN	-/-			-			-/-						
YELLOW CLEARANCE		3						3					
RED CLEARANCE			1			1			1				
WALK INTERVAL	8			8			8						
PEDESTRIAN CLEARANCE	11				13		1						
MEMORY	-			-			-						
RECALL	MAX			OFF			OFF						

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5		HOURS OF OPERATION
1	90	71	53	22	15		-
2	90	48	53	22	25		-
3	100	63	63	22	15		-
FLASH OPERATION		-	-	-	-		-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: East India Row and Atlantic Avenue

DATE: \_\_\_\_\_

INTERSECTION No.: 2007

DATE FIRST IN SERVICE: \_\_\_\_\_

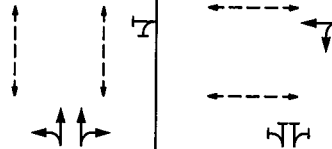
SECTION No.: 13

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO					
		G	R	-	-	W	DW
FROM	G	G	Y	-	-	-	-
	R	-	R	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	W	-	-	-	-	W	FDW
	DW	-	-	-	-	-	DW

</



STREET	DIR	FACE	Ø1			Ø5									
EAST INDIA ROW	WB	-	R	R	R	G	Y	R							FR
ATLANTIC AVE	NB	-	G	Y	R	R	R	R							FY
CROSSWALK	-	-	W/ FDW	DW	DW	DW	DW	DW							OFF
CROSSWALK	-	-	DW	DW	DW	W/ FDW	DW	DW							OFF

### TIMING IN SECONDS

MINIMUM GREEN	8			8									
EXTENSION	2			2									
MAXIMUM #1/#2 GREEN	-/-			-									
YELLOW CLEARANCE		3			3								
RED CLEARANCE			1			1							
WALK INTERVAL	8			8									
PEDESTRIAN CLEARANCE	9			8									
MEMORY	-			-									
RECALL	MAX			OFF									

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø5			HOURS OF OPERATION
1	90	65	55	35			-
2	90	67	55	35			-
3	100	95	70	30			-
FLASH OPERATION		-	-	-			-

## OPERATION SCHEDULE

DATE: \_\_\_\_\_

DATE FIRST IN SERVICE: \_\_\_\_\_

## EXISTING CONDITIONS

**\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION**

### COORDINATION INFORMATION (TIMES IN SECONDS)

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Milk Street and Atlantic Avenue

DATE: \_\_\_\_\_







INTERSECTION No.: 2006

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO												
		G	R	-	-	W	DW							
FROM	G	G	Y	-	-	-	-							FLASH OPERATION
	R	-	R	-	-	-	-							
	-	-	-	-	-	-	-							
	-	-	-	-	-	-	-							
	W	-	-	-	-	W	FDW							
	DW	-	-	-	-	-	DW							

STREET	DIR	FACE	Ø1			Ø2*			Ø5			Ø6			
MILK STREET	EB	-	R	R	R	R	R	R	G	Y	R	R	R	R	FR
MILK STREET	EB	-	R	R	R	R	R	R	GL	YL	R	R	R	R	FR
MILK STREET	WB	-	R	R	R	R	R	R	R	R	R	GR	YR	R	FR
ATLANTIC AVE	NB	-	G	Y	R	R	R	R	R	R	R	R	R	R	FY
CROSSWALK	-	-	W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW	W/ FDW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF

### TIMING IN SECONDS

MINIMUM GREEN	10			-			8			8		
EXTENSION	2			-			2			2		
MAXIMUM #1/#2 GREEN	-/-			-			-/-			-/-		
YELLOW CLEARANCE		3						3			3	
RED CLEARANCE			1			1			1			1
WALK INTERVAL	8			8			8					
PEDESTRIAN CLEARANCE	6				8					5		
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			OFF		

\*Ø2 PED RECALL FROM 7AM - 10PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	Ø6	HOURS OF OPERATION
1	90	60	39	17	22	12	-
2	90	71	37	17	23	13	-
3	100	0	48	17	21	14	-
FLASH OPERATION		-	-	-	-	-	-



# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Milk Street and Surface Arterty SB

DATE: \_\_\_\_\_

INTERSECTION No.: 1052

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

### EXISTING CONDITIONS

#### CLEARANCE TABLE

		TO																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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STREET	DIR	FACE	Ø1			Ø2*			Ø5						
MILK STREET	EB	-	R	R	R	R	R	R	G	Y	R				FR
SASB	SB	-	G	Y	R	R	R	R	R	R	R				FY
CROSSWALK	-	-	W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW				OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW				OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

#### TIMING IN SECONDS

MINIMUM GREEN	8			-			8								
EXTENSION	2			-			2								
MAXIMUM #1/#2 GREEN	-/-			-			-/-								
YELLOW CLEARANCE		3						3							
RED CLEARANCE			1			1			1						
WALK INTERVAL	8			8			8								
PEDESTRIAN CLEARANCE	10				11		10								
MEMORY	-			-			-								
RECALL	MAX			OFF			OFF								

\*Ø2 PED RECALL FROM 7AM - 10PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

#### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5		HOURS OF OPERATION
1	90	33	45	20	25		-
2	90	8	45	20	25		-
3	100	70	50	20	30		-
FLASH OPERATION		-	-	-	-		-

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø5			HOURS OF OPERATION
1	90	0	50	40			-
2	90	30	50	40			-
3	100	0	60	40			-
FLASH OPERATION		-	-	-			-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS OPERATION SCHEDULE

LOCATION: State Street and Surface Road

DATE: \_\_\_\_\_

INTERSECTION No.: 4106

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

## EXISTING CONDITIONS

CLEARANCE TABLE														FLASH OPERATION						
		TO																		
FROM		G	R	-	-	W	DW													
	G	G	Y	-	-	-	-													
	R	-	R	-	-	-	-													
	-	-	-	-	-	-	-													
	-	-	-	-	-	-	-													
	W	-	-	-	-	-	W	FDW												
DW	-	-	-	-	-	-	DW													
STREET		DIR	FACE					Ø1			Ø2*			Ø5						
STATE STREET		WB	-					R	R	R	R	R	R	R	R	R				FR
SURFACE ROAD		SB	-					G	Y	R	R	R	R	G	Y	R				FY
CROSSWALK		-	-					W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW				OFF
CROSSWALK		-	-					DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW				OFF
CROSSWALK		-	-					DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

## TIMING IN SECONDS

MINIMUM GREEN	8			-			8							
EXTENSION	2			-			2							
MAXIMUM #1/#2 GREEN	-/-			-			-/-							
YELLOW CLEARANCE		3						3						
RED CLEARANCE			1			1			1					
WALK INTERVAL	8			8			8							
PEDESTRIAN CLEARANCE	10				8		10							
MEMORY	-			-			-							
RECALL	MAX			OFF			OFF							

\*Ø2 PED RECALL FROM 7AM - 10PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

## COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	HOURS OF OPERATION	
1	90	55	43	17	30	-	
2	90	30	43	17	30	-	
3	100	56	48	17	35	-	
FLASH OPERATION		-	-	-	-	-	

## OPERATION SCHEDULE

DATE: \_\_\_\_\_

DATE FIRST IN SERVICE: \_\_\_\_\_

## EXISTING CONDITIONS

\*Ø2 PED RECALL FROM 7AM - 10PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Mercantile Street and Surface Road

DATE: \_\_\_\_\_

INTERSECTION No.: 4117

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

### EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	R	-	-	-													
		-	-	-	-	-	-													
		-	-	-	-	-	-													
W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	DW														
STREET		DIR	FACE		Ø1			Ø2*												
MERCANTILE ST		WB	-		R	R	R	G	Y	R							FR			
SURFACE ROAD		SB	-		G	Y	R	R	R	R							FY			
SURFACE ROAD		SB	-		G	Y	R	R	R	R							FY			
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW							OFF			
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW							OFF			

### TIMING IN SECONDS

MINIMUM GREEN	4			8											
EXTENSION	2			2											
MAXIMUM #1/#2 GREEN	-/-			-											
YELLOW CLEARANCE		3		3											
RED CLEARANCE			1		1										
WALK INTERVAL	8			8											
PEDESTRIAN CLEARANCE	11			11											
MEMORY	-			-											
RECALL	MAX			OFF											

\*Ø2 PED RECALL FROM 7AM - 10PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2			HOURS OF OPERATION
1	90	0	60	30			-
2	90	0	62	28			-
3	100	40	65	35			-
FLASH OPERATION		-	-	-			-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Commercial Street and Cross Street

DATE: \_\_\_\_\_

INTERSECTION No.: 290

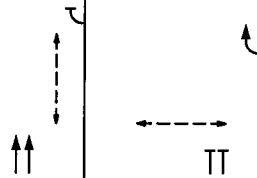
DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

## EXISTING CONDITIONS

### CLEARANCE TABLE

FROM	TO						
	G	R	-	-	W	DW	
	G	G	Y	-	-	-	-
	R	-	R	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
W	-	-	-	-	-	W	FDW
	DW	-	-	-	-	-	DW



FLASH  
OPERATION

STREET	DIR	FACE	Ø1			Ø5							
COMMERCIAL ST	WB	-	R	R	R	G	Y	R					FR
CROSS STREET	NB	-	G	Y	R	R	R	R					FY
CROSSWALK	-	-	W/ FDW	DW	DW	DW	DW	DW					OFF
CROSSWALK	-	-	DW	DW	DW	W/ FDW	DW	DW					OFF

### TIMING IN SECONDS

MINIMUM GREEN	8			8								
EXTENSION	2			2								
MAXIMUM #1/#2 GREEN	-/-			-								
YELLOW CLEARANCE		3			3							
RED CLEARANCE			1			1						
WALK INTERVAL	7			7								
PEDESTRIAN CLEARANCE	7			7								
MEMORY	-			-								
RECALL	MAX			OFF								

\*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø5			HOURS OF OPERATION
1	90	89	60	30			-
2	90	3	60	30			-
3	100	28	65	35			-
FLASH OPERATION		-	-	-			-

**SECTION No.: 13**

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5		HOURS OF OPERATION
1	90	58	38	22	30		-
2	90	48	32	22	36		-
3	100	80	38	22	40		-
FLASH OPERATION		-	-	-	-		-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Kneeland Street and Surface Artery SB

DATE: \_\_\_\_\_

INTERSECTION No.: 1290

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

### CLEARANCE TABLE

FROM		TO						PI						FLASH OPERATION
		G	R	-	-	W	DW							
G	G	G	Y	-	-	-	-	PI						
R	-	R	-	-	-	-	-							
-	-	-	-	-	-	-	-							
-	-	-	-	-	-	-	-							
W	-	-	-	-	-	W	FDW	PI						
DW	-	-	-	-	-	-	DW							

STREET	DIR	FACE	Ø1			Ø2*			Ø5			Ø6			
KNEELAND ST	EB	-	R	R	R	R	R	R	R	R	R	G	Y	R	FR
KNEELAND ST	WB	-	R	R	R	R	R	R	G	Y	R	G	Y	R	FR
KNEELAND ST	WB	-	R	R	R	R	R	R	GL	YL	R	G	Y	R	FR
SASB	SB	-	G	Y	R	R	R	R	R	R	R	R	R	R	FY
CROSSWALK	-	-	W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW	W/ FDW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF

### TIMING IN SECONDS

MINIMUM GREEN	8			-			4			8		
EXTENSION	2			-			2			2		
MAXIMUM #1/#2 GREEN	-/-			-			-/-			-/-		
YELLOW CLEARANCE		3						3			3	
RED CLEARANCE			3			1			3			3
WALK INTERVAL	7			7			4			7		
PEDESTRIAN CLEARANCE	15				16					9		
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			MIN		

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	Ø5	HOURS OF OPERATION
1	90	36	30	24	14	22	-
2	100	50	32	24	18	26	-
3	100	57	36	24	14	26	-
FLASH OPERATION		-	-	-	-	-	-



# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Beach Street and Surface Artery SB

DATE: \_\_\_\_\_

INTERSECTION No.: 1292

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

### CLEARANCE TABLE

CLEARANCE TABLE																				FLASH OPERATION		
FROM		TO																				
		G	R	-	-	W	DW															
		G	Y	-	-	-	-															
		R	R	-	-	-	-															
		-	-	-	-	-	-															
W		-	-	-	-	W	FDW															
DW		-	-	-	-	-	DW															
STREET			DIR	FACE				Ø1			Ø2*											
BEACH STREET			WB	-				R	R	R	R	R	R	GL	YL	R				FR		
SASB			SB	-				G	Y	R	R	R	R	R	R	R				FY		
CROSSWALK			-	-				W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW				OFF		
CROSSWALK			-	-				DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW				OFF		
CROSSWALK			-	-				DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF		

### TIMING IN SECONDS

MINIMUM GREEN	8			-			8					
EXTENSION	2			-			2					
MAXIMUM #1/#2 GREEN	-/-			-			-					
YELLOW CLEARANCE		3						3				
RED CLEARANCE			3			1			2			
WALK INTERVAL	7			7			7					
PEDESTRIAN CLEARANCE	4				9		6					
MEMORY	-			-			-					
RECALL	MAX			OFF			OFF					

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	HOURS OF OPERATION	
1	90	15	48	17	25	-	
2	100	31	58	17	25	-	
3	100	45	58	17	25	-	
FLASH OPERATION		-	-	-	-	-	

LOCATION: Essex Street and Lincoln Street and Surface Artery SB<sup>B</sup>  
INTERSECTION No.: 1291 SECTION No.: 11

# **BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS OPERATION SCHEDULE - EXISTING CONDITIONS**

DESIGN DATE: \_\_\_\_\_  
DATE FIRST IN SERVICE: \_\_\_\_\_

[illegible]

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Essex Street and South Street

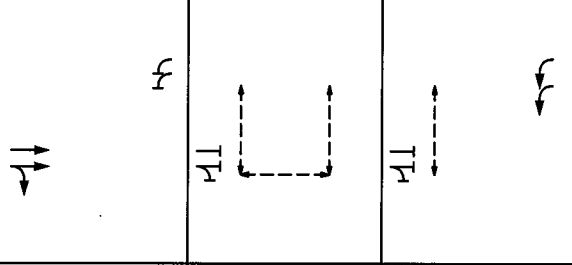
DATE: \_\_\_\_\_

INTERSECTION No.: 377

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

CLEARANCE TABLE														FLASH OPERATION					
FROM		TO																	
		G	R	-	-	W	DW												
		G	Y	-	-	-	-												
		R	-	R	-	-	-												
		-	-	-	-	-	-												
		-	-	-	-	-	-												
W	-	-	-	-	W	FDW													
DW	-	-	-	-	-	DW													
STREET		DIR	FACE				Ø1			Ø2*			Ø5						
ESSEX STREET		EB	-				G	Y	R	R	R	R	R	R	R				FY
ESSEX STREET		WB	-				R	R	R	R	R	R	GL	YL	R				FR
CROSSWALK		-	-				DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW				OFF
CROSSWALK		-	-				DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

## TIMING IN SECONDS

MINIMUM GREEN	8			-			8						
EXTENSION	2			-			2						
MAXIMUM #1/#2 GREEN	-/-			-			-/-						
YELLOW CLEARANCE		3						3					
RED CLEARANCE			2			1			1				
WALK INTERVAL				7			7						
PEDESTRIAN CLEARANCE					13		4						
MEMORY	-			-			-						
RECALL	MAX			OFF			OFF						

\*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

## COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	HOURS OF OPERATION
1	90	82	44	21	25	-
2	100	13	59	2	20	-
3	100	1	49	21	30	-
FLASH OPERATION		-	-	-	-	-

LOCATION: Summer Street & Purchase Street  
INTERSECTION No.: 3012    SECTION No.: 11

BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS  
OPERATION SCHEDULE - EXISTING CONDITIONS

DESIGN DATE: \_\_\_\_\_  
DATE FIRST IN SERVICE: \_\_\_\_\_

CLEARANCE TABLE																											FLASH OPERATION							
FROM		TO																																
		G																												R	-	-	W	DW
		G																												Y	-	-	-	-
		R																												-	R	-	-	-
-	-	-	-	-	-	-	-																											
-	-	-	-	-	-	-	-																											
W	-	-	-	-	W	FDW																												
DW	-	-	-	-	-	DW																												
STREET		DIR	FACE		Ø1			Ø2			Ø4			Ø5																				
SUMMER ST		EB	-		R	R	R	R	R	R	G	Y	R	R	R	R											FR							
SUMMER ST		WB	-		R	R	R	G	Y	R	R	R	R	R	R	R											FR							
SUMMER ST		WB	-		R	R	R	GL	YL	R	R	R	R	R	R	R											FR							
PURCHASE ST		SB	-		G	Y	R	R	R	R	R	R	R	G	Y	R											FY							
PURCHASE ST		SB	-		R	R	R	R	R	R	R	R	R	G	Y	R											FR							
RAMP		SB	-		G	Y	R	R	R	R	R	R	R	R	R	R											FY							
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW											OFF							
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW	W/ FDW	DW	DW	DW	DW	DW											OFF							
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW											OFF							
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW												OFF							
MINIMUM GREEN			10			10			5			5																						
EXTENSION			2			2			2			2																						
MAXIMUM #1/#2 GREEN			-/-			-			-/-			-/-																						
YELLOW CLEARANCE				3			3			3			3																					
RED CLEARANCE					3			4			2			3																				
WALK INTERVAL						7			7			7																						
PEDESTRIAN CLEARANCE						5			5			6																						
MEMORY			-			-			-			-																						
RECALL			MAX			OFF			MIN			OFF																						
COORDINATION INFORMATION (TIMES IN SECONDS)																																		
CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø4	Ø5											HOURS OF OPERATION	TECHNICAL NOTES																
1	90	26	26	21	19	24											-	-																
2	100	5	30	28	19	23											-	-																
3	100	0	30	26	19	25											-	-																
FLASH OPERATION		-	-	-	-	-											-	-																

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Congress Street and Purchase Street

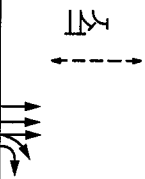
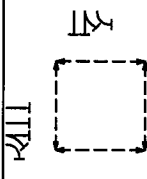
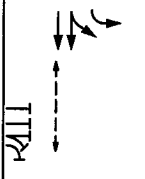
DATE: \_\_\_\_\_

INTERSECTION No.: 3055

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	R	-	-	-													
		-	-	-	-	-	-													
		-	-	-	-	-	-													
W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	-	DW													
STREET		DIR	FACE			Ø1			Ø2*			Ø5								
CONGRESS ST		EB	-			G	Y	R	R	R	R	R	R	R	R				FY	
PURCHASE ST		SB	-			R	R	R	R	R	R	G	Y	R				FR		
CROSSWALK		-	-			W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW				OFF		
CROSSWALK		-	-			DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW				OFF		
CROSSWALK		-	-			DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF		

## TIMING IN SECONDS

MINIMUM GREEN	8			-			8					
EXTENSION	2			-			2					
MAXIMUM #1/#2 GREEN	-/-			-			-/-					
YELLOW CLEARANCE		3						3				
RED CLEARANCE			3			1			3			
WALK INTERVAL	7			7			7					
PEDESTRIAN CLEARANCE	7				12		8					
MEMORY	-			-			-					
RECALL	MAX			OFF			OFF					

\*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

## COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	HOURS OF OPERATION	
1	90	59	40	19	31	-	
2	100	83	40	19	41	-	
3	100	59	37	19	44	-	
FLASH OPERATION		-	-	-	-	-	

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Kneeland Street and Lincoln Street

DATE: \_\_\_\_\_

INTERSECTION No.: 403

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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STREET	DIR	FACE	Ø1			Ø2			Ø3			Ø4			
KNEELAND ST	EB	-	R	R	R	R	R	R	G	Y	R	G	Y	R	FR
KNEELAND ST	EB	-	R	R	R	R	R	R	GL	YL	R	G	Y	R	FR
KNEELAND ST	WB	-	R	R	R	R	R	R	R	R	R	G	Y	R	FR
RAMP	NB	-	G	Y	R	R	R	R	R	R	R	R	R	R	FY
CROSSWALK	-	-	W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW	W/ FDW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF

### TIMING IN SECONDS

MINIMUM GREEN	8			-			8			8		
EXTENSION	2			-			2			2		
MAXIMUM #1/#2 GREEN	-/-			-			-			-		
YELLOW CLEARANCE		3						3			3	
RED CLEARANCE			3			1			3			3
WALK INTERVAL	7			7						7		
PEDESTRIAN CLEARANCE	3				17					2		
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			MIN		

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	90	16	26	25	15	24	-
2	100	99	21	25	15	39	-
3	100	16	31	25	15	29	-
FLASH OPERATION		-	-	-	-	-	-

SECTION No.: GC

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø3			HOURS OF OPERATION
1	90	5	45	45			-
2	90	60	64	26			-
3	100	25	60	40			-
FLASH OPERATION		-	-	-			-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: North Street and Cross Street

DATE: \_\_\_\_\_


INTERSECTION No.: 1961

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: GC

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO						
		G	R	-	-	W	DW	
FROM	G	G	Y	-	-	-	-	
	R	-	R	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	W	-	-	-	-	W	FDW	
	DW	-	-	-	-	-	DW	
<div><div><div><div><div></div><div>TH</div></div><div><div><div><div><div></div><div>TH</div></div><div><div><div><div><div></div><div>TH</div></div><div><div><div><div><div></div><div>TH</div></div></div></div></div></div></div></div></div></div></div></div></div></div>								
FLASH OPERATION								

STREET	DIR	FACE	Ø1			Ø2*			Ø5						
RAMP	EB	-	G	Y	R	R	R	R	R	R	R				FY
CROSS STREET	NB	-	R	R	R	R	R	R	G	Y	R				FR
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW				OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

### TIMING IN SECONDS

MINIMUM GREEN	8			-			8								
EXTENSION	2			-			2								
MAXIMUM #1/#2 GREEN	-/-			-			-/-								
YELLOW CLEARANCE		3						3							
RED CLEARANCE			2			1			2						
WALK INTERVAL				7			7								
PEDESTRIAN CLEARANCE					10		3								
MEMORY	-			-			-								
RECALL	MAX			OFF			OFF								

\*Ø2 PED RECALL FROM 7AM - 10PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	HOURS OF OPERATION		
1	90	55	27	18	45	-		
2	100	50	47	18	35	-		
3	100	43	37	18	45	-		
FLASH OPERATION		-	-	-	-	-		



## OPERATION SCHEDULE

DATE: \_\_\_\_\_

DATE FIRST IN SERVICE: \_\_\_\_\_

## EXISTING CONDITIONS

CLEARANCE TABLE																	PED ADVANCE 			FLASH OPERATION		
FROM		TO																				
		G	R	-	-	W	DW															
		G	Y	-	-	-	-															
		R	-	R	-	-	-															
		-	-	-	-	-	-															
-	-	-	-	-	-	-	-															
W	-	-	-	-	W	FDW	-	-	-	-	-	-	-	-	-	-						
DW	-	-	-	-	-	DW	-	-	-	-	-	-	-	-	-	-						
STREET		DIR	FACE		Ø1			Ø5			Ø6											
HANOVER ST		EB	-		R	R	R	R	R	R	G	Y	R	R			FR					
HANOVER ST		WB	-		R	R	R	G	Y	R	G	Y	R	R			FR					
HANOVER ST		WB	-		R	R	R	GL	YL	R	G	Y	R	R			FR					
SURFACE ROAD		SB	-		G	Y	R	R	R	R	R	R	R	R			FY					
CROSSWALK		-	-		W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW			OFF					
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW	W/ FDW	DW	DW	W			OFF					
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	W			OFF					
TIMING IN SECONDS																						
MINIMUM GREEN					10			-			10			-								
EXTENSION					2			-			2			-								
MAXIMUM #1/#2 GREEN					-/-			-			-			-								
YELLOW CLEARANCE						3			3			3										
RED CLEARANCE							2			2			2									
WALK INTERVAL					14			10			14			4								
PEDESTRIAN CLEARANCE					8						1											
MEMORY					-			-			-			-								
RECALL					MAX			MAX			MAX			MAX								
*Ø2 PUSH-BUTTON ACTUATED ONLY MAX. #2 DURING COORDINATED OPERATION																						
COORDINATION INFORMATION (TIMES IN SECONDS)																						
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø5		Ø6				HOURS OF OPERATION											
1	90		25	51	15		24				-											
2	100		35	51	25		24				-											
3	100		35	61	15		24				-											
FLASH OPERATION			-	-	-		-				-											

## OPERATION SCHEDULE

DATE: \_\_\_\_\_

DATE FIRST IN SERVICE: \_\_\_\_\_

## EXISTING CONDITIONS

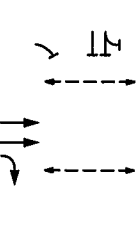
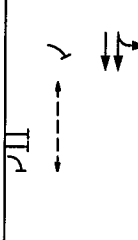
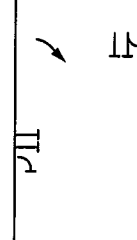
CLEARANCE TABLE																	FLASH OPERATION								
		TO																							
		G	R	-	-	W	DW																		
FROM	G	G	Y	-	-	-	-											Ø1	Ø5						
	R	-	R	-	-	-	-																		
	-	-	-	-	-	-	-																		
	W	-	-	-	-	W	FDW																		
DW	-	-	-	-	-	DW																			
STREET		DIR	FACE		Ø1			Ø5																	
HANOVER ST		EB	-		R	R	R	G	Y	R							FR								
HANOVER ST		WB	-		R	R	R	G	Y	R							FR								
CROSS STREET		NB	-		G	Y	R	R	R	R							FY								
CROSSWALK		-	-		W/ FDW	DW	DW	DW	DW	DW							OFF								
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW							OFF								
TIMING IN SECONDS																									
MINIMUM GREEN					8			8																	
EXTENSION					2			2																	
MAXIMUM #1/#2 GREEN					-/-			-																	
YELLOW CLEARANCE						3			3																
RED CLEARANCE							2			2															
WALK INTERVAL					15			8																	
PEDESTRIAN CLEARANCE					7			7																	
MEMORY					-			-																	
RECALL					MAX			OFF																	
*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED MAX. #2 DURING COORDINATED OPERATION																									
COORDINATION INFORMATION (TIMES IN SECONDS)																									
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø5					HOURS OF OPERATION															
1	90		20	50	40					-															
2	100		30	55	45					-															
3	100		23	55	45					-															
FLASH OPERATION			-	-	-					-															

## OPERATION SCHEDULE

DATE: \_\_\_\_\_

DATE FIRST IN SERVICE: \_\_\_\_\_

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	R	-	-	-													
-	-	-	-	-	-	-	-													
-	-	-	-	-	-	-	-													
W	-	-	-	-	W	FDW	-													
DW	-	-	-	-	-	DW	-													
STREET		DIR	FACE		Ø1		Ø3		Ø4											
NEW SUDBURY		EB	-		G	Y	R	R	R	R	R	R				FY				
SASB		SB	-		R	R	R	G	Y	R	R	R	R				FR			
MBTA DRIVEWAY		SB	-		R	R	R	R	R	R	G	Y	R				FR			
CROSSWALK		-	-		W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW				OFF			
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW				OFF			
TIMING IN SECONDS																				
MINIMUM GREEN					10			10			6									
EXTENSION					2			2			2									
MAXIMUM #1/#2 GREEN					-/-			-/-			-/-									
YELLOW CLEARANCE						3			3			3								
RED CLEARANCE							2			2			1							
WALK INTERVAL					8			8												
PEDESTRIAN CLEARANCE					8			9												
MEMORY					-		-		-											
RECALL					MAX		MAX		OFF											
MAX. #2 DURING COORDINATED OPERATION																				
COORDINATION INFORMATION (TIMES IN SECONDS)																				
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø3		Ø4				HOURS OF OPERATION									
1	90		56	52	22		16				-									
2	100		0	41	42		17				-									
3	100		67	61	22		17				-									
FLASH OPERATION			-	-	-		-				-									

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: New Sudbury Street and Cross Street

DATE: \_\_\_\_\_

INTERSECTION No.: 4094

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: GC

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION																																																																																																																																																																																																																																																																																																																																																																																																	
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## TIMING IN SECONDS

MINIMUM GREEN	10			4			10						
EXTENSION	2			2			2						
MAXIMUM #1/#2 GREEN	-/-			-/-			-/-						
YELLOW CLEARANCE		3			3			3					
RED CLEARANCE			3			1			3				
WALK INTERVAL	7						8						
PEDESTRIAN CLEARANCE	5						8						
MEMORY	-			-			-						
RECALL	MAX			OFF			OFF						

\*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

## COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	HOURS OF OPERATION	
1	90	70	40	8	42	-	
2	100	90	40	8	52	-	
3	100	85	40	8	52	-	
FLASH OPERATION		-	-	-	-	-	

## OPERATION SCHEDULE

DATE:

DATE FIRST IN SERVICE:

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
		TO																		
		G	R	-	-	W	DW													
FROM	G	G	Y	-	-	-	-													
	R	-	R	-	-	-	-													
	-	-	-	-	-	-	-													
	-	-	-	-	-	-	-													
	W	-	-	-	-	-	W	FDW												
	DW	-	-	-	-	-	DW													
STREET		DIR	FACE					Ø1			Ø2*			Ø5						
NEW CHARDON		EB	-					G	Y	R	R	R	R	R	R	R				FY
RAMP		WB	-					G	Y	R	R	R	R	R	R	R				FY
N. WASHINGTON		SB	-					R	R	R	R	R	R	G	Y	R				FR
NEW CHARDON		EB	-					G	Y	R	R	R	R	R	R	R				FY
NEW CHARDON		WB	-					G	Y	R	R	R	R	G	Y	R				FY
CROSSWALK		-	-					DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF
CROSSWALK		-	-					DW	DW	DW	W	FDW	DW	W/FDW	DW	DW				OFF
TIMING IN SECONDS																				
MINIMUM GREEN							8			-			8							
EXTENSION							2			-			2							
MAXIMUM #1/#2 GREEN							-/-			-			-/-							
YELLOW CLEARANCE								3						3						
RED CLEARANCE									3			1			4					
WALK INTERVAL										7			5							
PEDESTRIAN CLEARANCE											12		11							
MEMORY								-			-			-						
RECALL							MAX			OFF			OFF							
*Ø2 PED RECALL FROM 7AM - 3PM. OTHERWISE, PUSH-BUTTON ACTUATED MAX. #2 DURING COORDINATED OPERATION																				
COORDINATION INFORMATION (TIMES IN SECONDS)																				
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø5				HOURS OF OPERATION										
1	90		15	35	20	35				-										
2	100		7	30	20	50				-										
3	100		46	35	20	45				-										
FLASH OPERATION			-	-	-	-				-										

## OPERATION SCHEDULE

DATE: \_\_\_\_\_

DATE FIRST IN SERVICE:

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	-	-	-	-													
		-	-	-	-	-	-													
W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	DW														
STREET		DIR	FACE		Ø1			Ø2*			Ø5									
COOPER ST		WB	-		R	R	R	G	Y	R	R	R	R				FR			
RAMP		NB	-		R	R	R	R	R	R	G	Y	R				FR			
CROSS ST		NB	-		G	Y	R	R	R	R	R	R	R				FY			
CROSSWALK		-	-		W/ FDW	DW	DW	W/ FDW	DW	DW	DW	DW	DW				OFF			
CROSSWALK		-	-		W/ FDW	DW	DW	DW	DW	DW	W/ FDW	DW	DW				OFF			
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW	W/ FDW	DW	DW				OFF			
TIMING IN SECONDS																				
MINIMUM GREEN					8			8			8									
EXTENSION					2			2			2									
MAXIMUM #1/#2 GREEN					-/-			-			-/-									
YELLOW CLEARANCE						3			3			3								
RED CLEARANCE							2			2			3							
WALK INTERVAL					7			7			7									
PEDESTRIAN CLEARANCE					3			3			3									
MEMORY					-			-			-									
RECALL					MAX			OFF			OFF									
*Ø2 PUSH-BUTTON ACTUATED ONLY MAX. #2 DURING COORDINATED OPERATION																				
COORDINATION INFORMATION (TIMES IN SECONDS)																				
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø5			HOURS OF OPERATION											
1	90		17	55	15	20			-											
2	100		7	57	14	29			-											
3	100		43	53	15	32			-											
FLASH OPERATION			-	-	-	-			-											

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: North Washington Street and Beverly Street

DATE: \_\_\_\_\_



INTERSECTION No.: 4120

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: GC

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO																		FLASH OPERATION
		G	R	-	-	W	DW													
FROM	G	G	Y	-	-	-	-													
	R	-	R	-	-	-	-													
	-	-	-	-	-	-	-													
	-	-	-	-	-	-	-													
	W	-	-	-	-	-	W	FDW												
DW	-	-	-	-	-	-	DW													
STREET			DIR	FACE			Ø1			Ø5										
BEVERLY ST			EB	-			R	R	R	G	Y	R							FR	
N. WASHINGTON			SB	-			G	Y	R	R	R	R							FY	
CROSSWALK			-	-			W/ FDW	DW	DW	DW	DW	DW							OFF	
CROSSWALK			-	-			DW	DW	DW	W/ FDW	DW	DW							OFF	

### TIMING IN SECONDS

MINIMUM GREEN	8			8									
EXTENSION	2			2									
MAXIMUM #1/#2 GREEN	-/-			-									
YELLOW CLEARANCE		3			3								
RED CLEARANCE			2			2							
WALK INTERVAL	7			7									
PEDESTRIAN CLEARANCE	9			13									
MEMORY	-			-									
RECALL	MAX			OFF									

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø5			HOURS OF OPERATION
1	90	65	33	57			-
2	100	57	43	57			-
3	100	4	52	48			-
FLASH OPERATION		-	-	-			-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Valenti Street and North Washington Street

DATE: \_\_\_\_\_




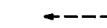
INTERSECTION No.: 332

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: GC

## EXISTING CONDITIONS

### CLEARANCE TABLE

CLEARANCE TABLE									MIN				FLASH OPERATION
		TO											
FROM		G	R	-	-	W	DW						
	G	G	Y	-	-	-	-						
	R	-	R	-	-	-	-						
	-	-	-	-	-	-	-						
	-	-	-	-	-	-	-						
	W	-	-	-	-	W	FDW						
	DW	-	-	-	-	-	DW						

STREET	DIR	FACE	Ø1			Ø5							
N. WASHINGTON	NB	-	G	Y	R	R	R	R					FY
N. WASHINGTON	NB	-	R	R	R	GL	GL	R					FY
N. WASHINGTON	SB	-	G	Y	R	R	R	R					FY
CROSSWALK	-	-	W/ FDW	DW	DW	DW	DW	DW					OFF
CROSSWALK	-	-	DW	DW	DW	W/ FDW	DW	DW					OFF

### TIMING IN SECONDS

MINIMUM GREEN	10			8								
EXTENSION	2			2								
MAXIMUM #1/#2 GREEN	-/-			-/-								
YELLOW CLEARANCE		3			3							
RED CLEARANCE			2			2						
WALK INTERVAL	7			7								
PEDESTRIAN CLEARANCE	13			14								
MEMORY	-			-								
RECALL	MAX			OFF								

MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø5	HOURS OF OPERATION		
1	90	34	64	26	-		
2	100	26	74	26	-		
3	100	68	74	26	-		
FLASH OPERATION		-	-	-	-		



## OPERATION SCHEDULE

DATE:

DATE FIRST IN SERVICE:

## EXISTING CONDITIONS

CLEARANCE TABLE																										FLASH OPERATION		
FROM		TO																										
		G	R	-	-	W	DW																					
		G	Y	-	-	-	-																					
		R	-	-	-	-	-																					
		-	-	-	-	-	-																					
W		-		-		W		FDW																				
DW		-		-		-		DW																				
STREET		DIR	FACE		Ø1			Ø2			Ø3			Ø4														
CONGRESS ST		EB	-		G	Y	R	G	Y	R	G	Y	R	R	R	R	FY											
CONGRESS ST		EB	-		R	R	R	R	R	R	GL	GL	R	R	R	R	FY											
CONGRESS ST		WB	-		GR	YR	R	R	R	R	R	R	R	R	R	R	FY											
ATLANTIC AVE		NB	-		R	R	R	R	R	R	R	R	R	G	Y	R	FR											
CROSSWALK		-	-		W/ FDW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF											
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF											
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	OFF											
TIMING IN SECONDS																												
MINIMUM GREEN					12			8			12			12														
EXTENSION					2			2			2			2														
MAXIMUM #1/#2 GREEN					-/-			-/-			-/-			-/-														
YELLOW CLEARANCE						3			2			3			3													
RED CLEARANCE							1			1			1			1												
WALK INTERVAL					7			7						7														
PEDESTRIAN CLEARANCE					8			8						8														
MEMORY					-			-			-			-														
RECALL					MAX			OFF			OFF			OFF														
MAX. #2 DURING COORDINATED OPERATION																												
COORDINATION INFORMATION (TIMES IN SECONDS)																												
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION																				
1	90		43	21	18	25	26	-																				
2	100		60	21	18	31	30	-																				
3	100		34	21	18	30	31	-																				
FLASH OPERATION			-	-	-	-	-	-																				

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Summer Street and Atlantic Avenue

DATE: \_\_\_\_\_

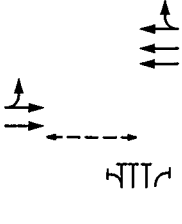
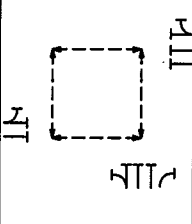
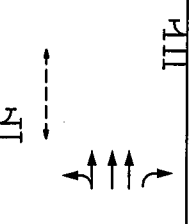
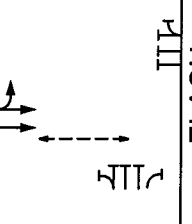
INTERSECTION No.: 43

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

### EXISTING CONDITIONS

#### CLEARANCE TABLE

		TO										FLASH OPERATION
		G	R	-	-	W	DW					
FROM	G	G	Y	-	-	-	-					
	R	-	R	-	-	-	-					
	-	-	-	-	-	-	-					
	-	-	-	-	-	-	-					
	W	-	-	-	-	W	FDW					
	DW	-	-	-	-	-	DW					

STREET	DIR	FACE	Ø1			Ø2			Ø3			Ø4			
SUMMER ST	EB	-	G	Y	R	R	R	R	R	R	R	G	Y	R	FY
SUMMER ST	EB	-	G	Y	R	R	R	R	R	R	R	GL	YL	R	FY
SUMMER ST	WB	-	G	Y	R	R	R	R	R	R	R	R	R	R	FY
ATLANTIC AVE	NB	-	R	R	R	R	R	R	G	Y	R	R	R	R	FR
CROSSWALK	-	-	W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW	W/ FDW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF

#### TIMING IN SECONDS

MINIMUM GREEN	9			-			19			5		
EXTENSION	2			-			2			2		
MAXIMUM #1/#2 GREEN	-/-			-			-			-		
YELLOW CLEARANCE		3						3			2	
RED CLEARANCE			2			1			2			1
WALK INTERVAL	10			12			7			5		
PEDESTRIAN CLEARANCE					14		12					
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			OFF		

\*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

#### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	90	55	27	27	28	8	-
2	100	32	27	27	38	8	-
3	100	19	30	27	35	8	-
FLASH OPERATION		-	-	-	-	-	-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Essex Street and Atlantic Avenue

DATE: \_\_\_\_\_

INTERSECTION No.: 45

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO									FLASH OPERATION
		G	R	-	-	W	DW				
FROM	G	G	Y	-	-	-	-				
	R	-	R	-	-	-	-				
	-	-	-	-	-	-	-				
	-	-	-	-	-	-	-				
	W	-	-	-	-	W	FDW				
	DW	-	-	-	-	-	DW				

STREET	DIR	FACE	Ø1			Ø2*			Ø3						
ESSEX STREET	EB	-	R	R	R	R	R	R	GL	YL	R				FR
ATLANTIC AVE	NB	-	G	Y	R	R	R	R	R	R	R				FY
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW				OFF

### TIMING IN SECONDS

MINIMUM GREEN	10			-			10								
EXTENSION	2			-			2								
MAXIMUM #1/#2 GREEN	-/-			-			-/-								
YELLOW CLEARANCE		3						3							
RED CLEARANCE			2			1			2						
WALK INTERVAL				7			7								
PEDESTRIAN CLEARANCE					10		11								
MEMORY	-			-			-								
RECALL	MAX			PED			OFF								

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3		HOURS OF OPERATION
1	90	43	40	18	32		-
2	100	84	47	18	35		-
3	100	1	42	18	40		-
FLASH OPERATION		-	-	-	-		-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Beach Street and Atlantic Avenue



DATE: \_\_\_\_\_

INTERSECTION No.: 44

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	-	-	-	-													
		-	-	-	-	-	-													
-	-	-	-	-	-	-	-													
W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	DW														
STREET			DIR	FACE		Ø1			Ø2*											
ATLANTIC AVE			NB	-		G	Y	R	R	R	R							FY		
CROSSWALK			-	-		DW	DW	DW	W	FDW	DW							OFF		

## TIMING IN SECONDS

MINIMUM GREEN	20			-													
EXTENSION	2			-													
MAXIMUM #1/#2 GREEN	-/-			-													
YELLOW CLEARANCE		3															
RED CLEARANCE			2			1											
WALK INTERVAL				10													
PEDESTRIAN CLEARANCE				11													
MEMORY	-			-													
RECALL	MAX			OFF													

\*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

## COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2			HOURS OF OPERATION
1	90	40	66	24			-
2	100	50	76	24			-
3	100	50	76	24			-
FLASH OPERATION		-	-	-			-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Kneeland Street and Atlantic Avenue and Ramps

DATE: \_\_\_\_\_

INTERSECTION No.: 3078

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

CLEARANCE TABLE												FLASH OPERATION					
FROM		TO															
		G	R	-	-	W	DW										
		G	Y	-	-	-	-										
		R	-	R	-	-	-										
		-	-	-	-	-	-										
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
W	-	-	-	-	-	W	FDW	-	-	-	-	-	-	-	-		
DW	-	-	-	-	-	-	DW	-	-	-	-	-	-	-	-		
STREET		DIR	FACE		Ø1			Ø2			Ø3			Ø4			
KNEELAND ST		EB	-		R	R	R	R	R	R	G	Y	R	R	R	R	FR
KNEELAND ST		EB	-		R	R	R	R	R	R	GL	YL	R	R	R	R	FR
DRIVEWAY		WB	-		R	R	R	G	Y	R	R	R	R	R	R	R	FR
FRONTAGE RD		NB	-		R	R	R	R	R	R	R	R	R	R	R	R	FY
RAMP		NB	-		G	Y	R	R	R	R	R	R	R	G	Y	R	FY
FRAMP		NB	-		G	Y	R	R	R	R	R	R	R	GL	YL	R	FY
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	OFF
TIMING IN SECONDS																	
MINIMUM GREEN					8			8			8			8			
EXTENSION					2			2			2			2			
MAXIMUM #1/#2 GREEN					-/-			-			-			-			
YELLOW CLEARANCE						3			3			3			3		
RED CLEARANCE							3			1			1			2	
WALK INTERVAL								7			7						
PEDESTRIAN CLEARANCE								7			7						
MEMORY					-			-			-			-			
RECALL					MAX			OFF			OFF			OFF			
MAX. #2 DURING COORDINATED OPERATION																	
COORDINATION INFORMATION (TIMES IN SECONDS)																	
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION									
1	90		0	25	18	23	24	-									
2	100		46	19	18	30	33	-									
3	100		35	26	18	23	33	-									
FLASH OPERATION			-	-	-	-	-	-									

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: North Street and Clinton Street

DATE: \_\_\_\_\_

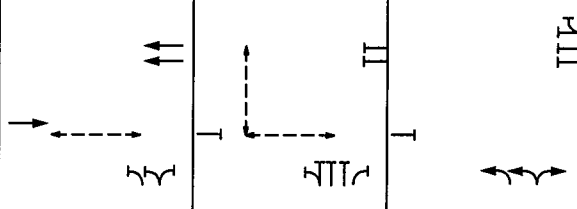
INTERSECTION No.: 4108

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: GC

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO																		FLASH OPERATION
		G	R	-	-	W	DW													
FROM	G	G	Y	-	-	-	-													
	R	-	R	-	-	-	-													
	-	-	-	-	-	-	-													
	-	-	-	-	-	-	-													
	W	-	-	-	-	W	FDW													
DW	-	-	-	-	-	-	DW													
STREET		DIR	FACE				Ø1			Ø2			Ø3							
NORTH STREET		EB	-				G	Y	R	R	R	R	R	R	R	R				FY
NORTH STREET		WB	-				G	Y	R	R	R	R	R	R	R	R				FY
CLINTON STREET		NB	-				R	R	R	R	R	R	G	Y	R				FR	
CROSSWALK		-	-				W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW				OFF
CROSSWALK		-	-				DW	DW	DW	W	FDW	DW	DW	DW	DW	DW				OFF

### TIMING IN SECONDS

MINIMUM GREEN	23			-			9					
EXTENSION	2			-			2					
MAXIMUM #1/#2 GREEN	-/-			-			-					
YELLOW CLEARANCE		4						4				
RED CLEARANCE			1			1			1			
WALK INTERVAL	15			7								
PEDESTRIAN CLEARANCE	8			10								
MEMORY	-			-			-					
RECALL	MAX			OFF			OFF					

\*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	HOURS OF OPERATION
1	90	55	38	20	32	-
2	100	59	52	20	28	-
3	100	59	52	20	28	-
FLASH OPERATION		-	-	-	-	-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: State Street and Congress Street

DATE: \_\_\_\_\_

INTERSECTION No.: 52

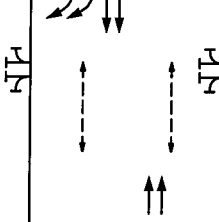
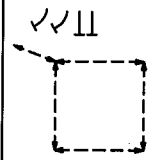
DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: GC

### EXISTING CONDITIONS

#### CLEARANCE TABLE

FROM	TO						
	G	R	-	-	W	DW	
	G	Y	-	-	-	-	
	R	R	-	-	-	-	
	-	-	-	-	-	-	
	-	-	-	-	-	-	
	W	-	-	-	W	FDW	
	DW	-	-	-	-	DW	



FLASH  
OPERATION

STREET	DIR	FACE	Ø1			Ø2*			Ø3						
STATE STREET	WB	-	G	Y	R	R	R	R	R	R	R				FY
CONGRESS ST	NB	-	R	R	R	R	R	R	G	Y	R				FR
CONGRESS ST	SB	-	R	R	R	R	R	R	G	Y	R				FR
CONGRESS ST	SB	-	R	R	R	R	R	R	GR	YR	R				FR
CROSSWALK	-	-	W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW				OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	W/ FDW	DW	DW				OFF
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

#### TIMING IN SECONDS

MINIMUM GREEN	10			-			10								
EXTENSION	2			-			2								
MAXIMUM #1/#2 GREEN	-/-			-			-/-								
YELLOW CLEARANCE		3						3							
RED CLEARANCE			4			1			1						
WALK INTERVAL	10			7			10								
PEDESTRIAN CLEARANCE	2				14		4								
MEMORY	-			-			-								
RECALL	MAX			OFF			OFF								

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

#### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	HOURS OF OPERATION
1	90	64	35	22	33	-
2	90	64	26	22	42	-
3	100	65	29	22	49	-
FLASH OPERATION		-	-	-	-	-

LOCATION: North Street & Congress Street

INTERSECTION No.: 26      SECTION No.: GC

BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

OPERATION SCHEDULE - EXISTING CONDITIONS

DESIGN DATE: \_\_\_\_\_

DATE FIRST IN SERVICE: \_\_\_\_\_

CLEARANCE TABLE																											FLASH OPERATION							
		TO																																
FROM	G	G																												R	-	-	W	DW
	G	-																												Y	-	-	-	-
	R	-																												-	-	-	-	-
	-	-																												-	-	-	-	-
W	-	-	-	-	-	W	FDW																											
DW	-	-	-	-	-	-	DW																											
STREET		DIR	FACE		Ø1			Ø2			Ø3			Ø4			Ø5																	
NORTH STREET		WB	-		R	R	R	R	R	R	R	R	G	Y	R	R	R	R										FR						
CONGRESS ST		NB	-		G	Y	R	G	Y	R	R	R	R	R	R	R	R	R										FY						
CONGRESS ST		NB	-		G	Y	R	R	R	R	R	R	R	R	R	R	R	R										FY						
CONGRESS ST		SB	-		G	Y	R	R	R	R	R	R	R	R	R	G	Y	R										FY						
CONGRESS ST		SB	-		R	R	R	R	R	R	R	R	R	R	R	GL	YL	R										FY						
																												FY						
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW											OFF					
MINIMUM GREEN					10			6			-		8			3																		
EXTENSION					2			2			-		2			2																		
MAXIMUM #1/#2 GREEN					-/-			-			-/-		-/-			-/-																		
YELLOW CLEARANCE						4			4					3			3																	
RED CLEARANCE							1			1			4			1			1															
WALK INTERVAL											7																							
PEDESTRIAN CLEARANCE												11																						
MEMORY					-			-			-			-			-																	
RECALL					MAX			MAX			OFF			OFF			OFF																	
COORDINATION INFORMATION (TIMES IN SECONDS)																																		
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø3	Ø4	Ø5				HOURS OF OPERATION				TECHNICAL NOTES																		
1	90		24	21	11	22	28	8				-				-																		
2	100		21	15	11	22	44	8				-				-																		
3	100		15	27	11	22	32	8				-				-																		
FLASH OPERATION			-	-	-	-	-	-				-				-																		



# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: North Street and Union Street

DATE: \_\_\_\_\_

INTERSECTION No.: 1909

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: GC

### EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION		
FROM		TO																				
		G	R	-	-	W	DW															
		G	Y	-	-	-	-															
		R	-	R	-	-	-															
		-	-	-	-	-	-															
-	-	-	-	-	-	-	-															
W	-	-	-	-	W	FDW	-	-	-	-	-	-	-	-	-	-						
DW	-	-	-	-	-	DW	-	-	-	-	-	-	-	-	-	-						
STREET		DIR	FACE					Ø1			Ø5			Ø6								
NORTH STREET		EB	-					G	Y	R	G	Y	R	R	R	R				FY		
NORTH STREET		EB	-					G	Y	R	GL	GL	R	R	R	R				FY		
NORTH STREET		WB	-					G	Y	R	R	R	R	R	R	R				FY		
CROSSWALK		-	-					DW	DW	DW	DW	DW	DW	W	FDW	DW				OFF		

### TIMING IN SECONDS

MINIMUM GREEN	25			10			-										
EXTENSION	2			-			-										
MAXIMUM #1/#2 GREEN	-/-			-/-			-										
YELLOW CLEARANCE		3			3												
RED CLEARANCE			1			1			4								
WALK INTERVAL							8										
PEDESTRIAN CLEARANCE							10										
MEMORY	-			-			-										
RECALL	MAX			MAX			OFF										

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø5	Ø6	HOURS OF OPERATION	
1	90	73	42	26	22	-	
2	100	64	57	21	22	-	
3	100	70	40	38	22	-	
FLASH OPERATION		-	-	-	-	-	

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Hanover Street and Congress Street

DATE: \_\_\_\_\_

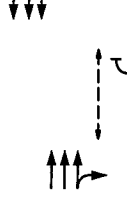
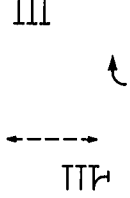
INTERSECTION No.: 4035

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: GC

### EXISTING CONDITIONS

#### CLEARANCE TABLE

		TO															FLASH OPERATION
		G	R	-	-	W	DW										
FROM	G	G	Y	-	-	-	-										
	R	-	R	-	-	-	-										
	-	-	-	-	-	-	-										
	-	-	-	-	-	-	-										
	W	-	-	-	-	W	FDW										
	DW	-	-	-	-	-	DW										
STREET			DIR	FACE			Ø1			Ø2*							
HANOVER ST			WB	-			R	R	R	GR	YR	R					FR
CONGRESS ST			NB	-			G	Y	R	R	R	R					FY
CONGRESS ST			SB	-			G	Y	R	R	R	R					FY
CROSSWALK			-	-			W/ FDW	DW	DW	DW	DW	DW					OFF
CROSSWALK			-	-			DW	DW	DW	W/ FDW	DW	DW					OFF

#### TIMING IN SECONDS

MINIMUM GREEN	51			5						
EXTENSION	2			2						
MAXIMUM #1/#2 GREEN	-/-			-/-						
YELLOW CLEARANCE		3			3					
RED CLEARANCE			2			1				
WALK INTERVAL	7			8						
PEDESTRIAN CLEARANCE	9			19						
MEMORY	-			-						
RECALL	MAX			OFF						

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

#### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2			HOURS OF OPERATION
1	90	71	59	31			-
2	100	66	69	31			-
3	100	90	67	33			-
FLASH OPERATION		-	-	-			-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: New Sudbury Street and Congress Street and Merrimac Street

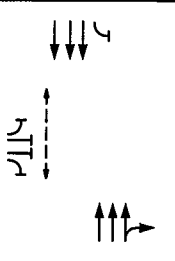
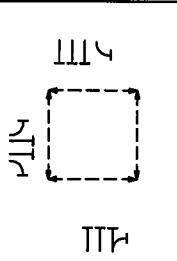
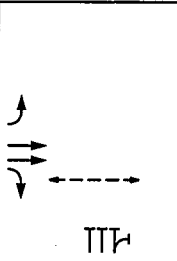
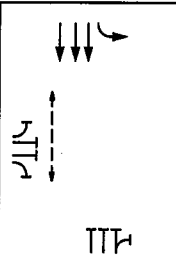
DATE: \_\_\_\_\_

INTERSECTION No.: 1685

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: GC

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	-	-	-	-													
		-	-	-	-	-	-													
		-	-	-	-	-	-													
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## TIMING IN SECONDS

MINIMUM GREEN	10			-			11			7		
EXTENSION	2			-			2			2		
MAXIMUM #1/#2 GREEN	-/-			-			-/-			-/-		
YELLOW CLEARANCE		3						4			4	
RED CLEARANCE			3						3			1
WALK INTERVAL				8			7					
PEDESTRIAN CLEARANCE					16		8					
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			OFF		

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

## COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	Ø6	HOURS OF OPERATION
1	90	79	25	26	23	16	-
2	100	74	33	26	23	18	-
3	100	10	32	26	24	18	-
FLASH OPERATION		-	-	-	-	-	-

LOCATION: New Chardon Street at Merrimac Street

INTERSECTION No.: 311      SECTION No.: GC

BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

OPERATION SCHEDULE - EXISTING CONDITIONS

DESIGN DATE: \_\_\_\_\_

DATE FIRST IN SERVICE: \_\_\_\_\_

CLEARANCE TABLE																											FLASH OPERATION						
TO																																	
FROM	G	G	R	Y	-	-	W	DW																									
	G	G	R	Y	-	-	W	DW																									
	R	-	-	-	-	-	-	-																									
	-	-	-	-	-	-	-	-																									
	-	-	-	-	-	-	-	-																									
	W	-	-	-	-	-	W	FDW																									
	DW	-	-	-	-	-	-	DW																									
STREET		DIR	FACE		Ø1			Ø2			Ø3			Ø4																			
NEW CHARDON		EB	-		R	R	R	R	R	R	G	Y	R	R	R	R													FR				
NEW CHARDON		WB	-		R	R	R	G	Y	R	G	Y	R	R	R	R													FR				
NEW CHARDON		WB	-		R	R	R	GL	YL	R	R	R	R	R	R	R													FR				
MERRIMAC ST		NB	-		G/GL	Y/YL	R	R	R	R	R	R	R	R	R	R													FY				
MERRIMAC ST		NB	-		GR	YR	R	GR	YR	R	R	R	R	R	R	R													FY				
MERRIMAC ST		SB	-		R	R	R	R	R	R	R	R	R	G/GL	Y/YL	R													FY				
GARAGE		NB	-		R	R	R	R	R	R	R	R	R	G	Y	R													FR				
CROSSWALK		-	-		W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW													OFF				
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW	W/ FDW	DW	DW	DW	DW	DW													OFF				
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW													OFF				
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW													OFF				
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	W/ FDW	DW	DW													OFF				
MINIMUM GREEN					7			7			10			10															TIMING IN SECONDS				
EXTENSION					2			2			2			2																			
MAXIMUM #1/#2 GREEN					-/-			-/-			-/-			-/-																			
YELLOW CLEARANCE						4			4			4			4																		
RED CLEARANCE							3			3			3			3																	
WALK INTERVAL					7						7			7																			
PEDESTRIAN CLEARANCE					10						12			7																			
MEMORY					-			-			-			-																			
RECALL					MAX			OFF			OFF			OFF																			
COORDINATION INFORMATION (TIMES IN SECONDS)																																	
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø5	Ø6					HOURS OF OPERATION					TECHNICAL NOTES																
1	90		74	26	17	26	21					-					-																
2	100		74	33	20	26	21					-					-																
3	100		14	34	17	26	23					-					-																
FLASH OPERATION			-	-	-	-	-					-					-																

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Summer Street and Dorchester Avenue

DATE: \_\_\_\_\_

INTERSECTION No.: 46

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

### CLEARANCE TABLE

FROM	TO							FLASH OPERATION
	G	R	-	-	W	DW		
	G	Y	-	-	-	-		
	R	R	-	-	-	-		
	-	-	-	-	-	-		
	W	-	-	-	W	FDW		
	DW	-	-	-	-	DW		

STREET	DIR	FACE	Ø1			Ø2*			Ø3						
SUMMER ST	EB	-	G	Y	R	R	R	R	R	R	R				FY
SUMMER ST	WB	-	G	Y	R	R	R	R	R	R	R				FY
DORCHESTER AVE	NB	-	R	R	R	R	R	R	G	Y	R				FR
DORCHESTER AVE	SB	-	R	R	R	R	R	R	G	Y	R				FR
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

### TIMING IN SECONDS

MINIMUM GREEN	10			-			10								
EXTENSION	2			-			2								
MAXIMUM #1/#2 GREEN	-/-			-			-/-								
YELLOW CLEARANCE		3						3							
RED CLEARANCE			1			1			1						
WALK INTERVAL				7											
PEDESTRIAN CLEARANCE					15										
MEMORY	-			-			-								
RECALL	MAX			OFF			OFF								

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	HOURS OF OPERATION		
1	90	60	32	23	35	-		
2	100	53	52	23	25	-		
3	100	61	37	23	40	-		
FLASH OPERATION		-	-	-	-	-		

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Summer Street and Melcher Street

DATE: \_\_\_\_\_

INTERSECTION No.: 2008

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO						
		G	R	-	-	W	DW	
FROM	G	G	Y	-	-	-	-	
	R	-	R	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	W	-	-	-	-	W	FDW	
	DW	-	-	-	-	-	DW	

FLASH  
OPERATION

STREET	DIR	FACE	Ø1			Ø2*			Ø3						
SUMMER ST	EB	-	G	Y	R	R	R	R	R	R	R				FY
SUMMER ST	WB	-	G	Y	R	R	R	R	R	R	R				FY
MELCHER ST	NB	-	R	R	R	R	R	R	G	Y	R				FR
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

### TIMING IN SECONDS

MINIMUM GREEN	8			-			8							
EXTENSION	2			-			2							
MAXIMUM #1/#2 GREEN	-/-			-			-/-							
YELLOW CLEARANCE		3						3						
RED CLEARANCE			2			1			2					
WALK INTERVAL				8										
PEDESTRIAN CLEARANCE					17									
MEMORY	-			-			-							
RECALL	MAX			OFF			OFF							

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	HOURS OF OPERATION	
1	90	70	36	26	28	-	
2	100	43	46	26	28	-	
3	100	71	44	26	30	-	
FLASH OPERATION		-	-	-	-	-	

LOCATION: Summer Street & Pump House Road  
INTERSECTION No.: 4061    SECTION No.: SB

BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS  
OPERATION SCHEDULE - EXISTING CONDITIONS

DESIGN DATE: \_\_\_\_\_  
DATE FIRST IN SERVICE: \_\_\_\_\_

CLEARANCE TABLE																										FLASH OPERATION				
TO																														
FROM	G	R	-	-	W	DW																								
	G	Y	-	-	-	-																								
	R	-	-	-	-	-																								
	-	-	-	-	-	-																								
W	-	-	-	-	W	FDW																								
DW	-	-	-	-	-	DW																								
STREET			DIR	FACE		Ø1			Ø2			Ø3			Ø4			Ø5												
SUMMER ST			EB	-		G	Y	R	R	R	R	R	R	R	G	Y	R											FY		
SUMMER ST			EB	-		G	Y	R	R	R	R	R	R	R	GL	YL	R											FY		
SUMMER ST			WB	-		G	Y	R	R	R	R	R	R	R	R	R	R											FY		
DRIVEWAY			NB	-		R	R	R	R	R	R	R	G	Y	R	R	R	R										FR		
DRIVEWAY			NB	-		R	R	R	R	R	R	R	GL	YL	R	R	R	R										FR		
PUMP HOUSE RD			SB	-		R	R	R	R	R	R	G	Y	R	R	R	R	R										FR		
PUMP HOUSE RD			SB	-		R	R	R	R	R	R	GL	YL	R	R	R	R	R										FR		
CROSSWALK			-	-		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW											OFF		
MINIMUM GREEN						10			-			10			5			5										TIMING IN SECONDS		
EXTENSION						3			-			3			3			3												
MAXIMUM #1/#2 GREEN						-/-			-			-/-			-/-			-/-												
YELLOW CLEARANCE							3						3			3			3											
RED CLEARANCE								3			1			3			3			1										
WALK INTERVAL									7																					
PEDESTRIAN CLEARANCE										17																				
MEMORY						-			-			-			-			-												
RECALL						MAX			OFF			OFF			OFF			OFF												
COORDINATION INFORMATION (TIMES IN SECONDS)																														
CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	Ø5				HOURS OF OPERATION					TECHNICAL NOTES														
1	90	2	21	25	22	12	10				-					-														
2	100	17	28	25	25	12	10				-					-														
3	100	2	25	25	28	12	10				-					-														
FLASH OPERATION		-	-	-	-	-	-				-					-														

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Mass Haul Road and Pump House Road

DATE: \_\_\_\_\_

INTERSECTION No.: 9061

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

### EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	R	-	-	-													
		-	-	-	-	-	-													
-	-	-	-	-	-															
W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	DW														
STREET		DIR	FACE		Ø1		Ø2		Ø3		Ø4									
HAUL ROAD		EB	-		G	Y	R	R	R	R	R	R	R	R	R	FY				
HAUL ROAD		WB	-		G	Y	R	R	R	R	R	R	G	Y	R	FR				
PUMP HOUSE RD		NB	-		R	R	R	G	Y	R	R	R	R	R	R	FR				
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	OFF				

### TIMING IN SECONDS

MINIMUM GREEN	15			15			-			6		
EXTENSION	3			3			-			3		
MAXIMUM #1/#2 GREEN	-/-			-/-			-			-/-		
YELLOW CLEARANCE		4			4						3	
RED CLEARANCE			3			2			1			1
WALK INTERVAL							7					
PEDESTRIAN CLEARANCE								14				
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			OFF		

MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	90	75	22	32	22	14	-
2	100	26	44	20	22	14	-
3	100	83	22	39	22	17	-
FLASH OPERATION		-	-	-	-	-	-

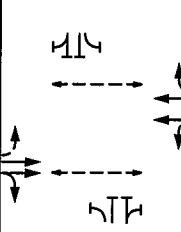
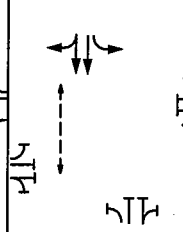
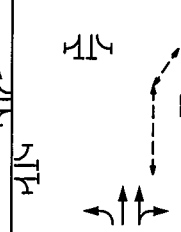
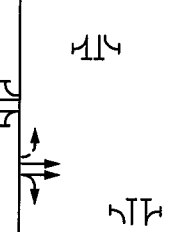


## OPERATION SCHEDULE

DATE:

DATE FIRST IN SERVICE:

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	R	-	-	-													
		-	-	-	-	-	-													
W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	DW														
STREET		DIR	FACE		Ø1			Ø2			Ø3			Ø4						
SUMMER ST		EB	-		G	Y	R	R	R	R	R	R	R	G	Y	R	FY			
SUMMER ST		EB	-		G	Y	R	R	R	R	R	R	R	GL	YL	R	FY			
SUMMER ST		WB	-		G	Y	R	R	R	R	R	R	R	R	R	R	FR			
SUMMER ST		WB	-		G	Y	R	GR	YR	R	R	R	R	R	R	R	FR			
D STREET		NB	-		R	R	R	R	R	R	G	Y	R	R	R	R	FR			
D STREET		SB	-		R	R	R	G	Y	R	R	R	R	R	R	R	FR			
CROSSWALK		-	-		W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF			
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF			
CROSSWALK		-	-		DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	OFF			
MINIMUM GREEN					10			6			6			6			TIMING IN SECONDS			
EXTENSION					3			3			3			3						
MAXIMUM #1/#2 GREEN					-/-			-			-/-			-/-						
YELLOW CLEARANCE						4			4			4			4					
RED CLEARANCE							2			1			1			1				
WALK INTERVAL					7			7			7									
PEDESTRIAN CLEARANCE					14			7			5									
MEMORY					-			-			-			-						
RECALL					MAX			PED			PED			OFF						
*Ø2 PUSH-BUTTON ACTUATED ONLY MAX. #2 DURING COORDINATED OPERATION																				
COORDINATION INFORMATION (TIMES IN SECONDS)																				
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2		Ø3		Ø4		HOURS OF OPERATION									
1	90		45	27	24		21		18		-									
2	100		80	30	26		26		18		-									
3	100		48	28	31		22		19		-									
FLASH OPERATION			-	-	-		-		-		-									

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Ramp D&B and D Street

DATE: \_\_\_\_\_

INTERSECTION No.: 4116

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION		
TO																						
FROM																						
G	R	-	-	W	DW																	
G	G	Y	-	-	-	-	-															
R	-	R	-	-	-	-	-															
-	-	-	-	-	-	-	-															
-	-	-	-	-	-	-	-															
W	-	-	-	-	W	FDW																
DW	-	-	-	-	-	DW																
STREET		DIR	FACE		Ø1			Ø2*			Ø3											
D STREET		NB	-		G	Y	R	R	R	R	G	Y	R			FY						
D STREET		NB	-		R	R	R	R	R	R	GL	YL	R			FY						
D STREET		SB	-		G	Y	R	R	R	R	R	R	R			FY						
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	DW	DW	DW			OFF						
TIMING IN SECONDS																						
MINIMUM GREEN					15			-			15											
EXTENSION					2			2			2											
MAXIMUM #1/#2 GREEN					-/-			-			-/-											
YELLOW CLEARANCE						4						4										
RED CLEARANCE							2			1			2									
WALK INTERVAL								7														
PEDESTRIAN CLEARANCE									13													
MEMORY					-			-			-											
RECALL					MAX			OFF			OFF											
*Ø2 PUSH-BUTTON ACTUATED ONLY MAX. #2 DURING COORDINATED OPERATION																						
COORDINATION INFORMATION (TIMES IN SECONDS)																						
CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	HOURS OF OPERATION																
1	90	59	46	21	23	-																
2	100	14	56	21	23	-																
3	100	62	56	21	23	-																
FLASH OPERATION		-	-	-	-	-																

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: MBTA Silverline Transitway and D Street

DATE: \_\_\_\_\_

INTERSECTION No.: 4060

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

## EXISTING CONDITIONS

### CLEARANCE TABLE

FROM	TO						
	G	R	-	-	W	DW	
	G	Y	-	-	-	-	
	R	R	-	-	-	-	
	-	-	-	-	-	-	
	W	-	-	-	W	FDW	
	DW	-	-	-	-	DW	

STREET	DIR	FACE	Ø1			Ø2			Ø5						
TRANSITWAY	EB	-	R	R	R	R	R	R	G	Y	R				FR
TRANSITWAY	WB	-	R	R	R	R	R	R	G	Y	R				FR
D STREET	NB	-	G	Y	R	R	R	R	R	R	R				FY
D STREET	SB	-	G	Y	R	G	Y	R	R	R	R				FY
CROSSWALK	-	-	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW				OFF

### TIMING IN SECONDS

MINIMUM GREEN	20			5			8						
EXTENSION	3			3			3						
MAXIMUM #1/#2 GREEN	-/-			-			-/-						
YELLOW CLEARANCE		4			4			4					
RED CLEARANCE			2			1			2				
WALK INTERVAL	7												
PEDESTRIAN CLEARANCE	8												
MEMORY	-			-			-						
RECALL	MAX			MAX			OFF						

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3		HOURS OF OPERATION
1	90	62	48	12	30		-
2	100	95	58	12	30		-
3	100	57	58	12	30		-
FLASH OPERATION		-	-	-	-		-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Congress Street and D Street

INTERSECTION No.: 4059

DATE: \_\_\_\_\_

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

## EXISTING CONDITIONS

### CLEARANCE TABLE

FROM	TO						
	G	R	-	-	W	DW	
G	G	Y	-	-	-	-	-
R	-	R	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
W	-	-	-	-	W	FDW	
DW	-	-	-	-	-	DW	



FLASH  
OPERATION

STREET	DIR	FACE	Ø1			Ø2*			Ø3			Ø4			
CONGRESS ST	EB	-	G	Y	R	R	R	R	R	R	R	R	R	R	FY
CONGRESS ST	WB	-	R	R	R	R	R	R	R	R	R	G	Y	R	FY
D STREET	NB	-	R	R	R	G	Y	R	R	R	R	R	R	R	FR
D STREET	SB	-	R	R	R	R	R	R	G	Y	R	R	R	R	FR
CROSSWALK	-	-	W/ FDW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	-	DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	OFF
MINIMUM GREEN			12			8			8			8			TIMING IN SECONDS
EXTENSION			3			3			3			3			
MAXIMUM #1/#2 GREEN			-/-			-			-/-			-/-			
YELLOW CLEARANCE				4			4			4			4		
RED CLEARANCE					2			2			2			2	
WALK INTERVAL			7			7			7						
PEDESTRIAN CLEARANCE			5			9			8						
MEMORY			-			-			-			-			
RECALL			MAX			OFF			OFF			OFF			

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	90	27	24	22	21	23	-
2	100	57	24	22	25	29	-
3	100	57	24	22	25	29	-
FLASH OPERATION		-	-	-	-	-	-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Congress Street and B Street and Ramps D&F

DATE: \_\_\_\_\_

INTERSECTION No.: 4058

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

## EXISTING CONDITIONS

CLEARANCE TABLE																FLASH OPERATION	
FROM		TO															
		G	R	-	-	W	DW										
		G	Y	-	-	-	-										
		R	-	R	-	-	-										
		-	-	-	-	-	-										
		-	-	-	-	-	-										
-	-	-	-	-	-	-	-										
-	-	-	-	-	-	-	-										
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## TIMING IN SECONDS

MINIMUM GREEN	17			8			8			8		
EXTENSION	3			3			3			3		
MAXIMUM #1/#2 GREEN	-/-			-			-/-			-/-		
YELLOW CLEARANCE		4			4			4			4	
RED CLEARANCE			2			2			2			2
WALK INTERVAL	7			7						7		
PEDESTRIAN CLEARANCE	10			8						14		
MEMORY	-			-			-			-		
RECALL	MAX			MIN			OFF			OFF		

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

## COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	100	24	32	25	15	28	-
2	100	7	32	25	15	28	-
3	100	24	30	25	17	28	-
FLASH OPERATION		-	-	-	-	-	-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Congress Street and East Service Road

DATE: \_\_\_\_\_

INTERSECTION No.: 4056

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

### EXISTING CONDITIONS

#### CLEARANCE TABLE

		TO										FLASH OPERATION
		G	R	-	-	W	DW					
FROM	G	G	Y	-	-	-	-					
	R	-	R	-	-	-	-					
	-	-	-	-	-	-	-					
	-	-	-	-	-	-	-					
	W	-	-	-	-	W	FDW					
DW	-	-	-	-	-	DW						

STREET	DIR	FACE	Ø1			Ø2*			Ø3						
CONGRESS ST	EB	-	G	Y	R	R	R	R	R	R	R				FY
CONGRESS ST	WB	-	G	Y	R	R	R	R	R	R	R				FY
RAMP C	NB	-	R	R	R	R	R	R	G	Y	R				FR
RAMP I	NB	-	R	R	R	G	Y	R	R	R	R				FR
CROSSWALK	-	-	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW				OFF
CROSSWALK	-	-	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW				OFF
CROSSWALK	-	-	DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW				OFF

#### TIMING IN SECONDS

MINIMUM GREEN	15			8			10								
EXTENSION	3			3			3								
MAXIMUM #1/#2 GREEN	-/-			-			-/-								
YELLOW CLEARANCE		4			4			4							
RED CLEARANCE			3			2			2						
WALK INTERVAL	7			10			10								
PEDESTRIAN CLEARANCE	10			4			0								
MEMORY	-			-			-								
RECALL	MAX			OFF			OFF								

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

#### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	HOURS OF OPERATION		
1	90	18	50	15	25	-		
2	100	57	50	20	30	-		
3	100	20	58	15	27	-		
FLASH OPERATION		-	-	-	-	-		

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Congress Street and Boston Wharf Road

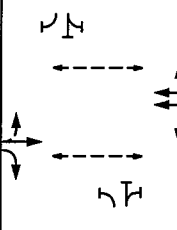
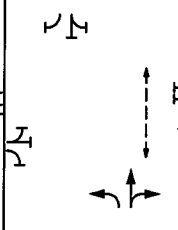
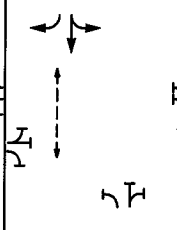
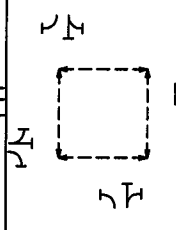

DATE: \_\_\_\_\_

INTERSECTION No.: 4057

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

### EXISTING CONDITIONS

CLEARANCE TABLE															FLASH OPERATION					
		TO																		
		G	R	-	-	W	DW													
FROM	G	G	Y	-	-	-	-													
	R	-	R	-	-	-	-													
	-	-	-	-	-	-	-													
	-	-	-	-	-	-	-													
	W	-	-	-	-	W	FDW													
	DW	-	-	-	-	-	DW													
STREET		DIR	FACE					Ø1		Ø2*		Ø3		Ø4						
CONGRESS ST		EB	-					G	Y	R	R	R	R	R	R	R	FY			
CONGRESS ST		WB	-					G	Y	R	R	R	R	R	R	R	FY			
BOSTON WHARF		NB	-					R	R	R	G/GL	Y/YL	R	R	R	R	FR			
BOSTON WHARF		SB	-					R	R	R	R	R	R	G/GL	Y/YL	R	FR			
CROSSWALK		-	-					W/ FDW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OFF	
CROSSWALK		-	-					DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	W	FDW	DW	OFF
CROSSWALK		-	-					DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	W	FDW	DW	OFF

### TIMING IN SECONDS

MINIMUM GREEN	15			15			4			-		
EXTENSION	3			3			3			3		
MAXIMUM #1/#2 GREEN	-/-			-/-			-/-			-		
YELLOW CLEARANCE		4			4			4				
RED CLEARANCE			2			2			2			1
WALK INTERVAL	7			7			7			5		
PEDESTRIAN CLEARANCE	10			10			11				0	
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			OFF		

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	90	55	29	23	32	6	-
2	100	31	29	23	42	6	-
3	100	61	29	23	42	6	-
FLASH OPERATION		-	-	-	-	-	-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Seaport Boulevard and B Street

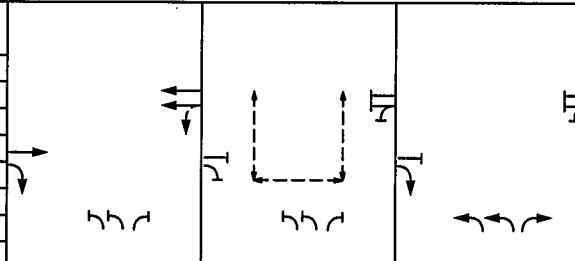
DATE: \_\_\_\_\_

INTERSECTION No.: 2351

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

### EXISTING CONDITIONS

CLEARANCE TABLE														FLASH OPERATION			
FROM		TO															
		G	R	-	-	W	DW										
		G	Y	-	-	-	-										
		R	-	R	-	-	-										
		-	-	-	-	-	-										
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
W	-	-	-	-	-	W	FDW	-	-	-	-	-	-	-			
DW	-	-	-	-	-	-	DW	-	-	-	-	-	-	-			
STREET		DIR	FACE		Ø1			Ø2*			Ø3						
SEAPORT BLVD		EB	-		G	Y	R	R	R	R	R	R	R				FY
SEAPORT BLVD		EB	-		G	Y	R	R	R	R	GR	YR	R				FY
SEAPORT BLVD		WB	-		G	Y	R	R	R	R	R	R	R				FY
B STREET		NB	-		R	R	R	R	R	R	G	Y	R				FR
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

### TIMING IN SECONDS

MINIMUM GREEN	10			-			9						
EXTENSION	3			3			3						
MAXIMUM #1/#2 GREEN	-/-			-			-/-						
YELLOW CLEARANCE		4						4					
RED CLEARANCE			1			1			1				
WALK INTERVAL				7									
PEDESTRIAN CLEARANCE					14								
MEMORY	-			-			-						
RECALL	MAX			OFF			OFF						

\*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3		HOURS OF OPERATION
1	90	81	43	22	25		-
2	100	3	41	22	37		-
3	100	90	53	22	25		-
FLASH OPERATION		-	-	-	-		-



LOCATION: Seaport Boulevard & East Service Road  
INTERSECTION No.: 3107 SECTION No.: SB

## BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS OPERATION SCHEDULE - EXISTING CONDITIONS

DESIGN DATE: \_\_\_\_\_  
DATE FIRST IN SERVICE: \_\_\_\_\_

CLEARANCE TABLE																																FLASH OPERATION
FROM		TO																														
		G	R	-	-	W	DW																									
		G	R	-	-	-	-																									
		-	-	-	-	-	-																									
		-	-	-	-	-	-																									
		G	R	-	-	W	FDW																									
		DW	-	-	-	-	DW																									
STREET			DIR	FACE		Ø1			Ø2			Ø3			Ø4			Ø5														
SEAPORT BLVD			EB	-		G	Y	R	R	R	R	R	R	R	G	Y	R	G	Y	R									FY			
SEAPORT BLVD			EB	-		G	Y	R	R	R	R	R	R	GL	YL	R	R	R	R									FY				
SEAPORT BLVD			WB	-		G	Y	R	R	R	R	R	R	R	R	R	R	R	R									FY				
EAST SERVICE			NB	-		R	R	R	G	Y	R	R	R	R	R	R	R	R	R									FR				
NORTHERN AVE			SB	-		R	R	R	R	R	R	G	Y	R	R	R	R	R	R									FR				
CROSSWALK			-	-		W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW										OFF				
CROSSWALK			-	-		DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW										OFF				
CROSSWALK			-	-		DW	DW	DW	W/ FDW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW										OFF				
CROSSWALK			-	-		DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW										OFF				
MINIMUM GREEN						13			8			8			5			2										TIMING IN SECONDS				
EXTENSION						5			3			3			2			2														
MAXIMUM #1/#2 GREEN						-/-			-			-/-			-/-			-/-														
YELLOW CLEARANCE							4			4			4			4																
RED CLEARANCE								3			2			2			2															
WALK INTERVAL						7			7			7					4															
PEDESTRIAN CLEARANCE						7			5			5																				
MEMORY						-			-			-			-			-														
RECALL						MAX			OFF			OFF			OFF			PED														
COORDINATION INFORMATION (TIMES IN SECONDS)																																
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø3	Ø4	Ø5				HOURS OF OPERATION				TECHNICAL NOTES																
1	90		3	31	21	21	13	4				-				-																
2	100		81	29	28	26	13	4				-				-																
3	100		3	29	28	26	13	4				-				-																
FLASH OPERATION			-	-	-	-	-	-				-				-																

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Seaport Boulevard and Sleeper Street

DATE: \_\_\_\_\_

INTERSECTION No.: 3109

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO										FLASH OPERATION				
		G	R	-	-	W	DW									
FROM	G	G	Y	-	-	-	-									
	R	-	R	-	-	-	-									
	-	-	-	-	-	-	-									
	-	-	-	-	-	-	-									
	W	-	-	-	-	W	FDW									
	DW	-	-	-	-	-	DW									

STREET	DIR	FACE	Ø1			Ø3			Ø4						
SEAPORT BLVD	EB	-	G	Y	R	R	R	R	R	R	R				FY
SEAPORT BLVD	WB	-	G	Y	R	R	R	R	G	Y	R				FY
SEAPORT BLVD	WB	-	G	Y	R	R	R	R	GL	YL	R				FY
SLEEPER ST	NB	-	R	R	R	G	Y	R	R	R	R				FR
SLEEPER ST	SB	-	R	R	R	G	Y	R	R	R	R				FR
CROSSWALK	-	-	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW				OFF
CROSSWALK	-	-	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW				OFF

### TIMING IN SECONDS

MINIMUM GREEN	8			8			8								
EXTENSION	2			2			2								
MAXIMUM #1/#2 GREEN	-/-			-			-/-								
YELLOW CLEARANCE		4			4			4							
RED CLEARANCE			1			1			1						
WALK INTERVAL	7			7											
PEDESTRIAN CLEARANCE	7			12											
MEMORY	-			-			-								
RECALL	MAX			OFF			OFF								

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø3	Ø4		HOURS OF OPERATION
1	90	0	50	25	15		-
2	100	0	56	30	14		-
3	100	0	46	37	17		-
FLASH OPERATION		-	-	-	-		-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Congress Street and Dorchester Avenue

DATE: \_\_\_\_\_

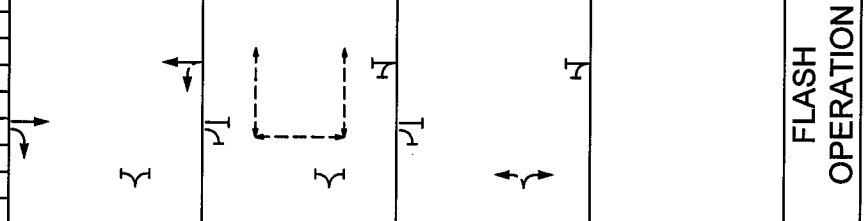
INTERSECTION No.: 361

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

### EXISTING CONDITIONS

#### CLEARANCE TABLE

		TO						
		G	R	-	-	W	DW	
FROM	G	G	Y	-	-	-	-	
	R	-	R	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	W	-	-	-	-	W	FDW	
	DW	-	-	-	-	-	DW	

FLASH  
OPERATION

STREET	DIR	FACE	Ø1			Ø2*			Ø3						
CONGRESS ST	EB	-	G	Y	R	R	R	R	R	R	R				FY
CONGRESS ST	WB	-	G	Y	R	R	R	R	R	R	R				FY
DORCHESTER	NB	-	R	R	R	R	R	R	G	Y	R				FR
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

#### TIMING IN SECONDS

MINIMUM GREEN	8			-			8							
EXTENSION	2			-			2							
MAXIMUM #1/#2 GREEN	-/-			-			-/-							
YELLOW CLEARANCE		3						3						
RED CLEARANCE			1			1			1					
WALK INTERVAL				7										
PEDESTRIAN CLEARANCE					9									
MEMORY	-			-			-							
RECALL	MAX			OFF			OFF							

\*Ø2 PED RECALL FROM 7AM-8PM. OTHERWISE, PUSH-BUTTON ACTUATED.  
MAX. #2 DURING COORDINATED OPERATION

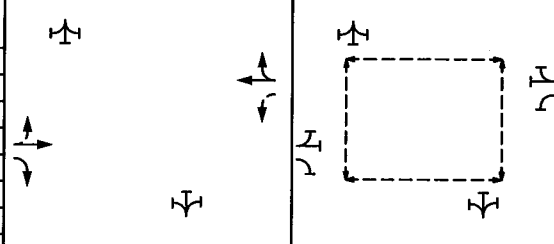
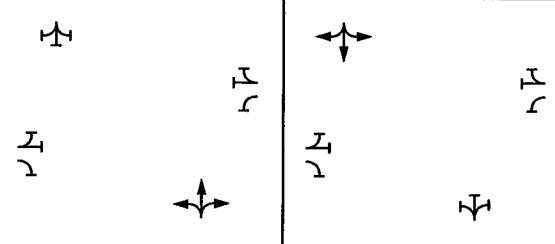
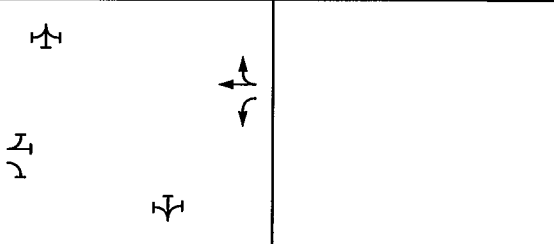
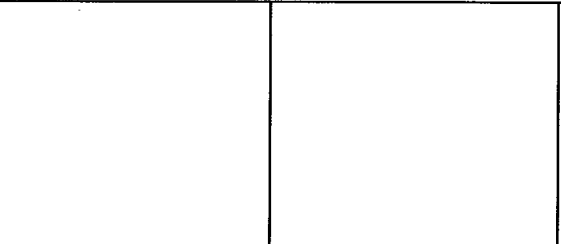
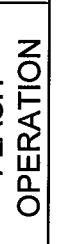
#### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3		HOURS OF OPERATION
1	90	63	42	17	31		-
2	100	52	35	17	38		-
3	100	66	43	17	40		-
FLASH OPERATION		-	-	-	-		-

LOCATION: Congress Street & A Street & Thomson Place  
INTERSECTION No.: 1662 SECTION No.: SB

## BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS OPERATION SCHEDULE - EXISTING CONDITIONS

DESIGN DATE: \_\_\_\_\_  
DATE FIRST IN SERVICE: \_\_\_\_\_

CLEARANCE TABLE																																																																																																																																																																																																																																																																																																																																									
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# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Summer Street and West Side Drive

DATE: \_\_\_\_\_

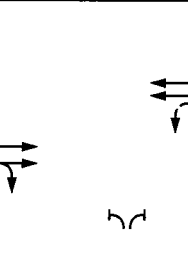
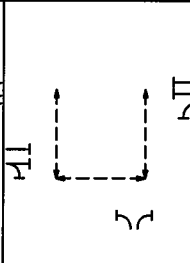
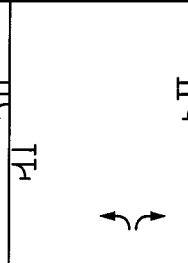
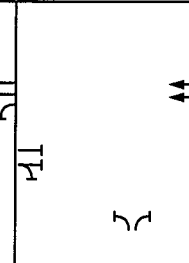

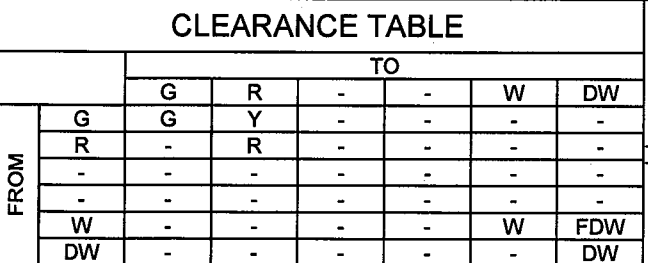
INTERSECTION No.: 4111

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

### EXISTING CONDITIONS

#### CLEARANCE TABLE

CLEARANCE TABLE																	
		TO															
		G	R	-	-	W	DW										
		G	Y	-	-	-	-										
		R	-	R	-	-	-										
		-	-	-	-	-	-										
FROM	-	-	-	-	-	-	-										
	W	-	-	-	-	W	FDW										
	DW	-	-	-	-	-	DW										
STREET		DIR	FACE		Ø1		Ø2*		Ø3		Ø4						
SUMMER ST		EB	-		G	Y	R	R	R	R	R	R	R	R	FY		
SUMMER ST		WB	-		G	Y	R	R	R	R	R	G	Y	R	FY		
SUMMER ST		WB	-		G	Y	R	R	R	R	R	GL	YL	R	FY		
WEST SIDE DR		NB	-		R	R	R	R	R	G	Y	R	R	R	FY		
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	OFF		

#### TIMING IN SECONDS

MINIMUM GREEN	10			-			10			6		
EXTENSION	2			-			2			2		
MAXIMUM #1/#2 GREEN	-/-			-			-/-			-/-		
YELLOW CLEARANCE		4						4			4	
RED CLEARANCE			2			1			2			2
WALK INTERVAL				7								
PEDESTRIAN CLEARANCE					20							
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			OFF		

\*Ø2 PUSH-BUTTON ACTUATED ONLY

MAX. #2 DURING COORDINATED OPERATION

#### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	80	20	18	28	20	14	-
2	100	0	22	28	20	30	-
3	100	20	32	28	20	20	-
FLASH OPERATION		-	-	-	-	-	-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Summer Street and World Trade Center Avenue

DATE: \_\_\_\_\_

INTERSECTION No.: 664

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO						
		G	R	-	-	W	DW	
FROM	G	G	Y	-	-	-	-	
	R	-	R	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	W	-	-	-	-	W	FDW	
	DW	-	-	-	-	-	DW	

STREET	DIR	FACE	Ø1			Ø2*			Ø3			Ø4			
SUMMER ST	EB	-	G	Y	R	R	R	R	R	R	R	R	R	R	FY
SUMMER ST	EB	-	G	Y	R	R	R	R	R	R	R	GL	YL	R	FY
SUMMER ST	WB	-	G	Y	R	R	R	R	R	R	R	R	R	R	FY
SUMMER ST	WB	-	G	Y	R	R	R	R	R	R	R	GL	YL	R	FY
WORLD TRADE	NB	-	R	R	R	R	R	R	G	Y	R	R	R	R	FR
WORLD TRADE	SB	-	R	R	R	R	R	R	G	Y	R	R	R	R	FR
CROSSWALK	-	-	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF

### TIMING IN SECONDS

MINIMUM GREEN	10			-			10			6		
EXTENSION	2			-			2			2		
MAXIMUM #1/#2 GREEN	-/-			-			-/-			-/-		
YELLOW CLEARANCE		4						4			4	
RED CLEARANCE			2			1			2			1
WALK INTERVAL				7								
PEDESTRIAN CLEARANCE					18							
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			OFF		

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	80	10	20	26	20	14	-
2	100	10	24	26	20	30	-
3	100	10	34	26	20	20	-
FLASH OPERATION		-	-	-	-	-	-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Seaport Boulevard and Boston Wharf Road

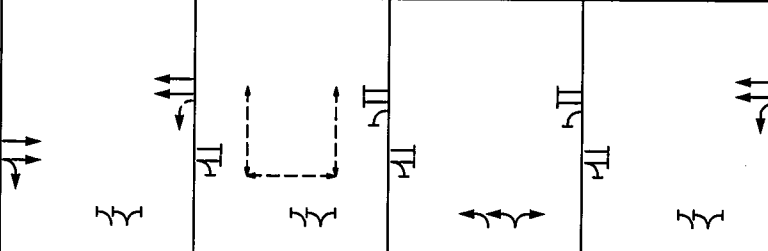
DATE: \_\_\_\_\_

INTERSECTION No.: 3108

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

### EXISTING CONDITIONS

CLEARANCE TABLE																FLASH OPERATION	
FROM		TO															
		G	R	-	-	W	DW										
		G	Y	-	-	-	-										
		R	-	R	-	-	-										
		-	-	-	-	-	-										
		W	-	-	-	-	W										
DW	-	-	-	-	-	DW											
STREET		DIR	FACE		Ø1		Ø2*		Ø3		Ø4						
SEAPORT BLVD		EB	-		G	Y	R	R	R	R	R	R	R	R	FY		
SEAPORT BLVD		WB	-		G	Y	R	R	R	R	R	R	G	Y	FY		
SEAPORT BLVD		WB	-		G	Y	R	R	R	R	R	R	GL	YL	FR		
BOSTON WHARF		NB	-		R	R	R	R	R	R	G	Y	R	R	FR		
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	OFF		

### TIMING IN SECONDS

MINIMUM GREEN	15	-	6	6
EXTENSION	3	-	3	3
MAXIMUM #1/#2 GREEN	-/-	-	-/-	-/-
YELLOW CLEARANCE	4	4	4	4
RED CLEARANCE	3	2	2	2
WALK INTERVAL	7			
PEDESTRIAN CLEARANCE	18			
MEMORY	-	-	-	-
RECALL	MAX	OFF	OFF	OFF

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	90	73	22	27	21	20	-
2	100	84	30	27	19	24	-
3	100	81	26	27	23	24	-
FLASH OPERATION		-	-	-	-	-	-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: South Station Connector (SSCONN) and Albany Street

DATE: \_\_\_\_\_

INTERSECTION No.: 4110

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

CLEARANCE TABLE											FLASH OPERATION						
FROM		TO															
		G	R	-	-	W	DW										
		G	G	Y	-	-	-							-			
		R	-	R	-	-	-							-			
-	-	-	-	-	-	-	-										
W	-	-	-	-	W	FDW	FDW										
DW	-	-	-	-	-	DW	DW										
STREET		DIR	FACE		Ø1			Ø2*			Ø3						
SSCONN		WB	-		R	R	R	R	R	R	G	Y	R				FR
ALBANY STREET		SB	-		G	Y	R	R	R	R	R	R	R				FY
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF
TIMING IN SECONDS																	
MINIMUM GREEN					8			-			8						
EXTENSION					2			-			2						
MAXIMUM #1/#2 GREEN					-/-			-			-/-						
YELLOW CLEARANCE						3						3					
RED CLEARANCE							2			1			2				
WALK INTERVAL								7									
PEDESTRIAN CLEARANCE									17								
MEMORY					-			-			-						
RECALL					MAX			OFF			OFF						
*Ø2 PUSH-BUTTON ACTUATED ONLY MAX. #2 DURING COORDINATED OPERATION																	
COORDINATION INFORMATION (TIMES IN SECONDS)																	
CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3				HOURS OF OPERATION								
1	90	51	45	25	20				-								
2	100	0	55	25	20				-								
3	100	57	55	25	20				-								
FLASH OPERATION		-	-	-	-				-								



**SECTION No.: 19**

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø3	Ø4		HOURS OF OPERATION
1	80	75	32	19	29		-
2	100	37	45	20	35		-
3	100	38	40	19	41		-
FLASH OPERATION		-	-	-	-		-

DESIGN DATE: \_\_\_\_\_  
DATE FIRST IN SERVICE: \_\_\_\_\_

CLEARANCE TABLE																																																																																																																																																																																													
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# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: South Station Connector (SSCONN) and Ramps K&X

DATE: \_\_\_\_\_

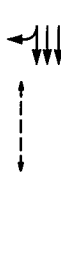
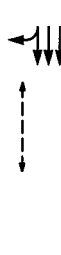
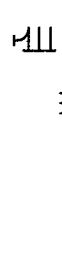
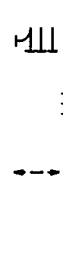
INTERSECTION No.: 4109

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

CLEARANCE TABLE														FLASH OPERATION						
FROM		TO																		
		G	R	-	-	W	DW													
		G	G	Y	-	-	-										-			
		G	R	-	-	W	DW													
		R	-	R	-	-	-	-												
		-	-	-	-	-	-	-												
		-	-	-	-	-	-	-												
		W	-	-	-	-	W	FDW												
		DW	-	-	-	-	-	DW												
STREET		DIR	FACE					Ø1			Ø2			Ø5						
SSCONN		EB	-					R	R	R	R	R	R	G	Y	R				FR
SSCONN		EB	-					R	R	R	GR	YR	R	G	Y	R				FR
SSCONN		WB	-					R	R	R	R	R	R	G	Y	R				FR
RAMP K		NB	-					G	Y	R	R	R	R	R	R	R				FY
LINCOLN ST		SB	-					G	Y	R	R	R	R	R	R	R				FY
CROSSWALK		-	-					DW	DW	DW	W/FDW	DW	DW	DW	DW	DW				OFF
TIMING IN SECONDS																				
MINIMUM GREEN							10			8			9							
EXTENSION							2			-			2							
MAXIMUM #1/#2 GREEN							-/-			-/-			-/-							
YELLOW CLEARANCE								4			4			4						
RED CLEARANCE									2			2			2					
WALK INTERVAL										7										
PEDESTRIAN CLEARANCE										8										
MEMORY							-			-			-							
RECALL							MAX			OFF			OFF							
MAX. #2 DURING COORDINATED OPERATION																				
COORDINATION INFORMATION (TIMES IN SECONDS)																				
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø5	HOURS OF OPERATION													
1	90		84	44	21	25	-													
2	100		76	54	21	25	-													
3	100		94	54	21	25	-													
FLASH OPERATION			-	-	-	-	-													

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	-	-	-	-	-													
		-	-	-	-	-	-													
		W	-	-	-	W	FDW													
		DW	-	-	-	-	DW													
STREET		DIR	FACE		Ø1			Ø2			Ø3			Ø4						
W 4th ST		WB	-		R	R	R	R	R	R	G	Y	R	G	Y	R	FR			
W 4th ST		WB	-		R	R	R	R	R	R	G	Y	R	R	R	R	FR			
FRNB		NB	-		G	Y	R	R	R	R	R	R	R	G	Y	R	FY			
ALBANY ST		SB	-		G	Y	R	G	Y	R	R	R	R	R	R	R	FY			
CROSSWALK		-	-		W/ FDW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF			
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW		DW	DW	W/ FDW	DW	DW	OFF			
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF			
TIMING IN SECONDS																				
MINIMUM GREEN					11			10			8			8						
EXTENSION					2			2			2			2						
MAXIMUM #1/#2 GREEN					-/-			-/-			-/-			-/-						
YELLOW CLEARANCE						4			4			3			3					
RED CLEARANCE							2			2			2			2				
WALK INTERVAL					8			7			7			7						
PEDESTRIAN CLEARANCE					4			13			10			7						
MEMORY					-			-			-			-						
RECALL					MAX			OFF			OFF			OFF						
MAX. #2 DURING COORDINATED OPERATION																				
COORDINATION INFORMATION (TIMES IN SECONDS)																				
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2		Ø3		Ø4		HOURS OF OPERATION									
1	90		0	18	26		23		23		-									
2	100		55	18	26		30		26		-									
3	100		55	18	26		30		26		-									
FLASH OPERATION			-	-	-		-		-		-									

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Traveler Street and Albany Street

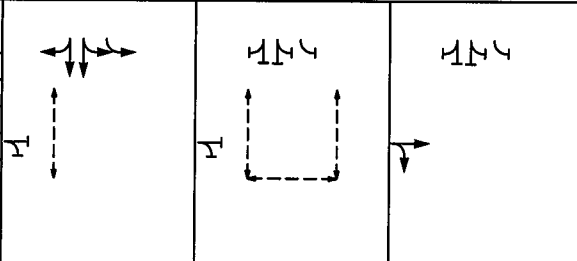
DATE: \_\_\_\_\_

INTERSECTION No.: 4115

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 19

## EXISTING CONDITIONS

CLEARANCE TABLE														FLASH OPERATION			
FROM		TO															
		G	R	-	-	W	DW										
		G	G	Y	-	-	-								-		
		R	-	R	-	-	-								-		
		-	-	-	-	-	-								-		
		-	-	-	-	-	-								-		
		W	-	-	-	-	W								FDW		
DW	-	-	-	-	-	DW											
STREET		DIR	FACE		Ø1			Ø2*			Ø3						
TRAVELER ST		EB	-		R	R	R	R	R	R	G	Y	R				FR
ALBANY ST		SB	-		G	Y	R	R	R	R	R	R	R				FY
CROSSWALK		-	-		W/ FDW	DW	DW	W	FDW	DW	DW	DW	DW				OFF
CROSSWALK		-	-		DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

## TIMING IN SECONDS

MINIMUM GREEN	8			-			8						
EXTENSION	2			-			2						
MAXIMUM #1/#2 GREEN	-/-			-			-/-						
YELLOW CLEARANCE		4						4					
RED CLEARANCE			1			1			1				
WALK INTERVAL	7			7									
PEDESTRIAN CLEARANCE	12				8								
MEMORY	-			-			-						
RECALL	MAX			OFF			OFF						

\*Ø2 PUSH-BUTTON ACTUATED ONLY  
MAX. #2 DURING COORDINATED OPERATION

## COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	HOURS OF OPERATION	
1	80	50	49	16	15	-	
2	100	60	64	16	20	-	
3	100	64	64	16	20	-	
FLASH OPERATION		-	-	-	-	-	



# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: MBTA Driveway (near Randolph) and Albany Street

DATE: \_\_\_\_\_

INTERSECTION No.: 1333

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 19

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
		TO																		
		G	R	-	-	W	DW													
FROM	G	G	Y	-	-	-	-													
	R	-	R	-	-	-	-													
	-	-	-	-	-	-	-													
	-	-	-	-	-	-	-													
	W	-	-	-	-	W	FDW													
DW	-	-	-	-	-	-	DW													
STREET			DIR	FACE			Ø1			Ø2			Ø3			Ø4				
MBTA DRIVE			EB	-			R	R	R	R	R	R	G	Y	R	R	R	R	FR	
ALBANY ST			NB	-			R	R	R	R	R	R	R	R	R	GR	YL	R	FR	
ALBANY ST			SB	-			G	Y	R	G	Y	R	R	R	R	R	R	R	FY	
ALBANY ST			SB	-			GL	YL	R	GL	YL	R	R	R	R	R	R	R	FY	
ALBANY ST			SB	-			GR	YR	R	R	R	R	R	R	R	R	R	R	FY	
CROSSWALK			-	-			W/ FDW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
CROSSWALK			-	-			DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	OFF	
CROSSWALK			-	-			DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	OFF	

### TIMING IN SECONDS

MINIMUM GREEN	15			15			12			10		
EXTENSION	2			2			2			2		
MAXIMUM #1/#2 GREEN	-/-			-/-			-/-			-/-		
YELLOW CLEARANCE		4			4			4			4	
RED CLEARANCE			2			2			3			2
WALK INTERVAL	7			7			7			7		
PEDESTRIAN CLEARANCE	3			3			3			3		
MEMORY	-			-			-			-		
RECALL	MAX			OFF			OFF			MAX		

MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	80	18	23	21	19	17	-
2	100	95	24	21	20	35	-
3	100	40	29	21	20	30	-
FLASH OPERATION		-	-	-	-	-	-

<b>BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS</b> <b>OPERATION SCHEDULE</b>	
LOCATION: <u>I-93 Ramp A2&amp;1 and Frontage Road Southbound</u>	DATE: _____
INTERSECTION No.: <u>9993</u>	DATE FIRST IN SERVICE: _____
SECTION No.: <u>7</u>	<b>EXISTING CONDITIONS</b>

DATE: \_\_\_\_\_

DATE FIRST IN SERVICE: \_\_\_\_\_

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION		
FROM		TO																				
		G	R	-	-	W	DW															
		G	R	-	-	-	-															
		R	-	R	-	-	-															
		-	-	-	-	-	-															
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
W	-	-	-	-	-	W	FDW	-	-	-	-	-	-	-	-	-	-	-				
DW	-	-	-	-	-	-	DW	-	-	-	-	-	-	-	-	-	-	-				
STREET		DIR	FACE		Ø1			Ø2														
RAMP		WB	-		R	R	R	G	Y	R								FR				
FRONTAGE RD		SB	-		G	Y	R	R	R	R								FY				
TIMING IN SECONDS																						
MINIMUM GREEN					8			8														
EXTENSION					2			2														
MAXIMUM #1/#2 GREEN					-/-			-/-														
YELLOW CLEARANCE						4			4													
RED CLEARANCE							2			2												
WALK INTERVAL																						
PEDESTRIAN CLEARANCE																						
MEMORY					-			-														
RECALL					MAX			OFF														
MAX. #2 DURING COORDINATED OPERATION																						
COORDINATION INFORMATION (TIMES IN SECONDS)																						
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2											HOURS OF OPERATION						
1	90		0	32	58											-						
2	100		0	47	53											-						
3	100		0	35	65											-						
FLASH OPERATION			-	-	-											-						

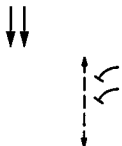
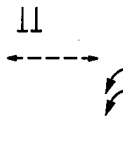


BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS  
**OPERATION SCHEDULE**

DATE: \_\_\_\_\_

DATE FIRST IN SERVICE: \_\_\_\_\_

## EXISTING CONDITIONS

CLEARANCE TABLE																				FLASH OPERATION
FROM		TO																		
		G	R	-	-	W	DW													
		G	Y	-	-	-	-													
		R	R	-	-	-	-													
		-	-	-	-	-	-													
		-	-	-	-	-	-													
W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	DW														
STREET		DIR	FACE		Ø1			Ø2												
NASHUA ST		WB	-		R	Y	R	G	Y	R							FR			
MARTHA RD		SB	-		G	Y	R	R	R	R							FY			
CROSSWALK		-	-		W/ FDW	DW	DW	DW	DW	DW							OFF			
CROSSWALK		-	-		DW	DW	DW	W/ FDW	DW	DW							OFF			
TIMING IN SECONDS																				
MINIMUM GREEN					15			15												
EXTENSION					3			3												
MAXIMUM #1/#2 GREEN					-/-			-/-												
YELLOW CLEARANCE						4			4											
RED CLEARANCE							1			1										
WALK INTERVAL					7			7												
PEDESTRIAN CLEARANCE					9			5												
MEMORY					-			-												
RECALL					MAX			OFF												
MAX. #2 DURING COORDINATED OPERATION																				
COORDINATION INFORMATION (TIMES IN SECONDS)																				
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2					HOURS OF OPERATION										
1	90		69	50	40					-										
2	90		69	45	45					-										
3	100		10	55	45					-										
FLASH OPERATION			-	-	-					-										

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: City Square (N. Washington St./Rutherford Ave./Chelsea St.)

DATE: \_\_\_\_\_

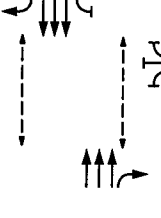
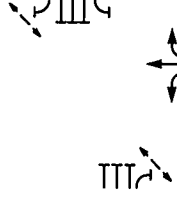
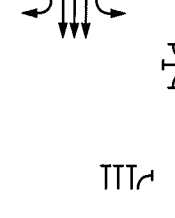

INTERSECTION No.: 162

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 30

### EXISTING CONDITIONS

#### CLEARANCE TABLE

		TO										FLASH OPERATION
		G	R	-	-	W	DW					
FROM	G	G	Y	-	-	-	-					
	R	-	R	-	-	-	-					
	-	-	-	-	-	-	-					
	-	-	-	-	-	-	-					
	W	-	-	-	-	W	FDW					
	DW	-	-	-	-	-	DW					

STREET	DIR	FACE	Ø1			Ø2			Ø5						
CHELSEA ST	WB	-	R	R	R	G	Y	R	R	R	R				FR
N. WASHINGTON	NB	-	G	Y	R	R	R	R	R	R	R				FY
RUTHERFORD	SB	-	G	Y	R	R	R	R	G	Y	R				FY
RUTHERFORD	SB	-	R	R	R	R	R	R	GL	YL	R				FY
CROSSWALK	-	-	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW				OFF
CROSSWALK	-	-	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW				OFF

#### TIMING IN SECONDS

MINIMUM GREEN	22			12			12								
EXTENSION	2			2			2								
MAXIMUM #1/#2 GREEN	-/-			-/-			-/-								
YELLOW CLEARANCE		3			3			3							
RED CLEARANCE			2			2			2						
WALK INTERVAL	7			7											
PEDESTRIAN CLEARANCE	15			5											
MEMORY	-			-			-								
RECALL	MAX			OFF			OFF								

MAX. #2 DURING COORDINATED OPERATION

#### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø5	HOURS OF OPERATION		
1	90	47	40	25	25	-		
2	100	82	39	35	26	-		
3	100	75	48	30	22	-		
FLASH OPERATION		-	-	-	-	-		

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS OPERATION SCHEDULE

LOCATION: Ramp LT-TL and Rutherford Avenue

DATE: \_\_\_\_\_

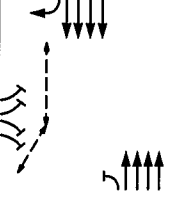
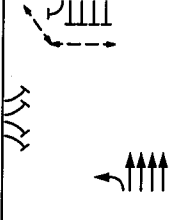
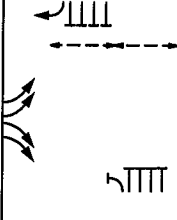
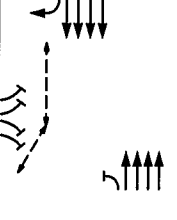
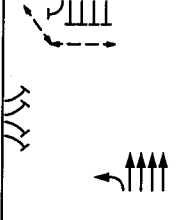
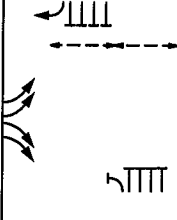
INTERSECTION No.: 2345

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 30

## EXISTING CONDITIONS

CLEARANCE TABLE

		TO										FLASH OPERATION
		G	R	-	-	W	DW					
FROM	G	G	Y	-	-	-	-					
	R	-	R	-	-	-	-					
	-	-	-	-	-	-	-					
	-	-	-	-	-	-	-					
	W	-	-	-	-	W	FDW					
	DW	-	-	-	-	-	DW					

STREET	DIR	FACE	Ø1			Ø2			Ø3						
RAMP TL	EB	-	R	R	R	R	R	R	G	Y	R				FR
RUTHERFORD	NB	-	G	Y	R	G	Y	R	R	R	R				FY
RUTHERFORD	NB	-	R	R	R	GL	YL	R	R	R	R				FY
RUTHERFORD	SB	-	G	Y	R	R	R	R	R	R	R				FY
RUTHERFORD	SB	-	GR	YR	R	R	R	R	GR	YR	R				FY

TIMING IN SECONDS

MINIMUM GREEN	21			14			17								
EXTENSION	2			2			2								
MAXIMUM #1/#2 GREEN	-/-			-/-			-/-								
YELLOW CLEARANCE		3			3			3							
RED CLEARANCE			2			2			2						
WALK INTERVAL	7			7			7								
PEDESTRIAN CLEARANCE	14			11			11								
MEMORY	-			-			-								
RECALL	MAX			OFF			OFF								

MAX. #2 DURING COORDINATED OPERATION

COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3		HOURS OF OPERATION
1	100	0	42	36	22		-
2	100	0	41	26	33		-
3	90	0	39	23	28		-
FLASH OPERATION		-	-	-	-		-

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

## OPERATION SCHEDULE

LOCATION: Albany Street Connector and Frontage Road Northbound

DATE: \_\_\_\_\_

INTERSECTION No.: 4110

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## EXISTING CONDITIONS

### CLEARANCE TABLE

		TO						
		G	R	-	-	W	DW	
FROM	G	G	Y	-	-	-	-	I
	R	-	R	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	W	-	-	-	-	W	FDW	
	DW	-	-	-	-	-	DW	

FLASH  
OPERATION

STREET	DIR	FACE	Ø1			Ø2			Ø3						
ALBANY CONN	EB	-	R	R	R	G	Y	R	R	R	R				FR
DRIVEWAY	WB	-	R	R	R	R	R	R	G	Y	R				FR
FRNB	NB	-	G	Y	R	R	R	R	R	R	R				FY
CROSSWALK	-	-	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW			OFF
CROSSWALK	-	-	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW			OFF

### TIMING IN SECONDS

MINIMUM GREEN	12			15			7					
EXTENSION	3			2			2					
MAXIMUM #1/#2 GREEN	-/-			-/-			-/-					
YELLOW CLEARANCE		4			3			4				
RED CLEARANCE			2			2			2			
WALK INTERVAL	7			7								
PEDESTRIAN CLEARANCE	9			11								
MEMORY	-			-			-					
RECALL	MAX			OFF			OFF					

MAX. #2 DURING COORDINATED OPERATION

### COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	HOURS OF OPERATION		
1	100	48	40	43	17	-		
2	120	50	51	52	17	-		
3	110	4	45	51	14	-		
FLASH OPERATION		-	-	-	-	-		

## Appendix D. Proposed Operations Schedules

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**BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS**

**OPERATION SCHEDULE**

LOCATION: Pearl Street and Atlantic Avenue

DESIGN DATE: 10/2009

INTERSECTION No.: 4102

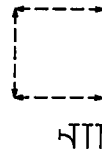
DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

**PHASE 1**

**CLEARANCE TABLE**

FROM	TO						
	G	R	-	-	W	DW	
	G	Y	-	-	-	-	
	R	R	-	-	-	-	
	-	-	-	-	-	-	
	-	-	-	-	-	-	
	W	-	-	-	W	FDW	
	DW	-	-	-	-	DW	



FLASH  
OPERATION

STREET	DIR	FACE	Ø1			Ø2*									
ATLANTIC AVE.	NB	3A,3B,3C	G	Y	R	R	R	R							FY
CROSSWALK	N/S	2E,5E	DW	DW	DW	W	FDW	DW							OFF
CROSSWALK	E/W	2F,3E,4E,5F	DW	DW	DW	W	FDW	DW							OFF

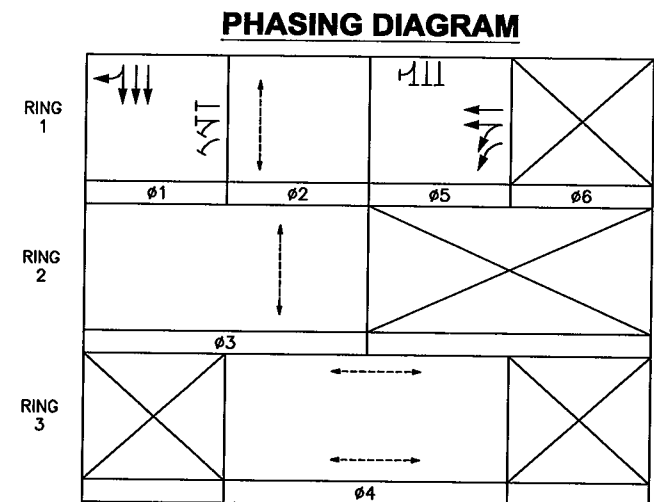
**TIMING IN SECONDS**

MINIMUM GREEN	25			-											
VEHICLE EXTENSION	2			-											
MAXIMUM #1 GREEN	84			-											
MAXIMUM #2 GREEN	79			-											
YELLOW CLEARANCE		3													
RED CLEARANCE			1			4									
WALK INTERVAL				8											
PEDESTRIAN CLEARANCE					5										
MEMORY	OFF			OFF											
RECALL (VEH/PED)	MAX			OFF											

\*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED

**COORDINATION INFORMATION (TIMES IN SECONDS)**

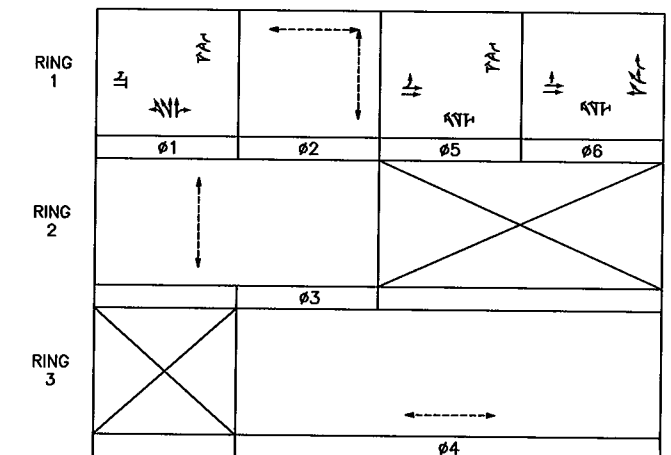
CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2			HOURS OF OPERATION
1	90	37	73	17			ALL OTHER TIMES
2	100	35	83	17			6:00AM - 10:00AM
3	100	17	83	17			2:30PM - 7:00PM
FLASH OPERATION		-	-	-			3:00AM - 6:00AM



<div><div><div><div></div><div>(APPROX.)</div></div><div><div>OLIVER STREET</div><div>SEAPORT BLVD</div></div><div><div>ATLANTIC AVENUE</div></div></div></div>		TIMING AND SEQUENCE CHART																		OPERATION FLASHING	
		<div><div><div></div><div></div><div></div><div></div></div></div>			<div><div><div></div><div></div><div></div></div></div>			<div><div><div></div><div></div><div></div></div></div>			<div><div><div></div><div></div><div></div></div></div>			<div><div><div></div><div></div><div></div></div></div>			<div><div><div></div><div></div><div></div></div></div>				
ø1			ø2			ø3			ø4			ø5			ø6						
STREET/DIRECTION/FACE		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL		
ATLANTIC AVE/NB/4D,5A,5B		G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		FY
OLIVER ST/EB/2B,2C		R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	G	Y	R		FR
OLIVER ST/EB/2A		R	R	R	R	R	R	R	R	R	R	R	R	GL/G	YL/Y	R	G	Y	R		FR
SEAPORT BLVD/WB/4A,4B,4C		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R		FR
C.W./N-S/3E,4E		DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW		OFF
C.W./E-W/2F,3F		DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW		OFF
C.W./-/2E,4F,5E,5F		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
INTERVAL SECONDS	MINIMUM GREEN	8			-			-			-			4			8				
	VEHICLE EXTENSION	2			-			-			-			2			2				
	MAXIMUM 1 GREEN	38			-			-			-			7			25				
	MAXIMUM 2 GREEN	27			-			-			-			13			31				
	YELLOW CLEARANCE		3												3			3			
	RED CLEARANCE			2			4			5			5			1				2	
	WALK INTERVAL				8			8*			8										
	PED. CLEARANCE					12			9**			6**									
MEMORY		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK				
RECALL (VEH./PED.)		MAX			OFF			PED			OFF			OFF			OFF				
PROGRAM/COORDINATION																					
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																		HOURS OF OPERATION ALL OTHER TIMES 6:00 A.M. TO 10:00 A.M. 2:30 P.M. TO 7:00 P.M.
			ø1,ø3			ø2,ø3,ø4			ø4,ø5			ø4,ø6									
1	90	57	31			24			9			26									
2	100	96	31			24			17			28									
3	100	65	32			24			8			36									
COORDINATED OPERATION																					EVERYDAY
---																					-----
---																					-----
PROGRAMMED FLASH																					EMERGENCY/CONFLICT
LOOP DETECTOR DATA									CLEARANCES								TECHNICAL NOTES				
IDENT.	QTY.	SIZE	SPLICE	URNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO							* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.				
									G	G	R	GL/G	-	-	W	DW					
									G	G	Y	-	-	-	-	-					
									GL/G	YL/G	YL/Y	GL/G	-	-	-	-					
									-	-	-	-	-	-	-	-					
									-	-	-	-	-	-	-	-					
									-	-	-	-	-	-	-	-					
									W	-	-	-	-	-	W	FDW					
									DW	-	-	-	-	-	-	DW					

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
DRAWN BY K. CHRONLEY  
CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
38 Chauncy St., 9th Floor  
Boston, MA 02111  
Ph: 617.482.7080  
Fax: 617.482.7417

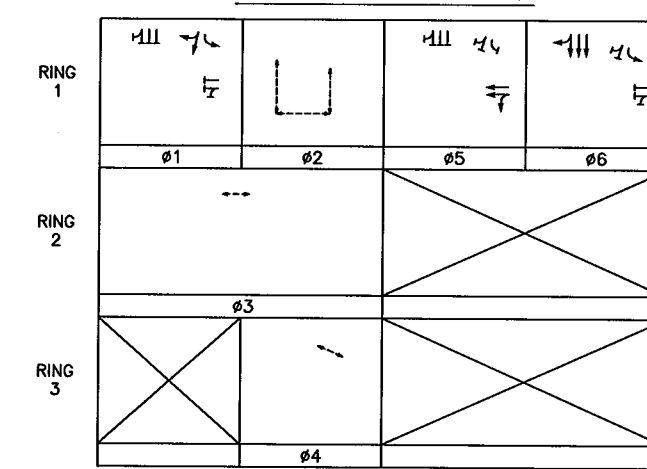
CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING  
**SEAPORT BLVD & ATLANTIC AVE**  
**PHASE 1**  
BOSTON PROPER  
INTERSECTION NUMBER 1216  
SCALE: NOT TO SCALE  
DISTRICT: -  
AREA: 13  
DESIGN DATE: OCT. 2009



TIMING AND SEQUENCE CHART																								
																					OPERATING FLASHING			
			ø1			ø2			ø3			ø4			ø5			ø6						
STREET/DIRECTION/FACE			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL				
RAMP CS-P/SB/3C,3D			GL/GR	YL/YR	R	R	R	R	R	R	R	R	R	R	R	R	R	GL/R	YL/R	R	FR			
RAMP CS-P/SB/4A			GR	YR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	GR	YR	RR	FR			
RAMP CS-P/SB/2A			GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	FR			
PURCHASE ST/SB/5A,5B,5C			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	FY			
OLIVER ST/WB/3A,3B			R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR			
C.W./E-W/6E,7F			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF			
C.W./E-W/7E,8E			DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF			
C.W./- /2E,4E,5E,5F,6F,8F			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF			
INTERVAL	MINIMUM GREEN		8													8				8				
	VEHICLE EXTENSION		2													2				2				
	MAXIMUM 1 GREEN		33													11				35				
	MAXIMUM 2 GREEN		34													13				37				
	YELLOW CLEARANCE			3											3				3					
	RED CLEARANCE				2				4			5					6				3	2		
	WALK INTERVAL					8						8*			8									
	PED. CLEARANCE								5			5**			6**									
	MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK					
	RECALL (VEH./PED.)			MAX			OFF			PED			OFF			OFF			OFF					
PROGRAM/COORDINATION																					HOURS OF OPERATION ALL OTHER TIMES 6:00 A.M. TO 10:00 A.M. 2:30 P.M. TO 7:00 P.M.  EVERYDAY ----- ----- EMERGENCY/CONFLICT			
CYCLE NO.		CYCLE LENGTH		OFFSET (SEC.)		PHASE SPLITS IN SECONDS																		
						ø1,ø3			ø2,ø3,ø4			ø5			ø6									
1		90		42		25			17			17			31									
2		100		56		39			17			19			25									
3		100		95		25			17			16			42									
COORDINATED OPERATION																								
----																								
PROGRAMMED FLASH																								
LOOP DETECTOR DATA									CLEARANCES								TECHNICAL NOTES							
IDENT.	QTY.	SIZE	SPLICE	URNS	MODE	øCALL	øEXT.	CHNL.	FROM	G	R	RR	GL/R	GL	W	DW	* ø3 SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.							
									G	G	Y	-	-	-	-	-								
									GL	-	YL	-	-	GL	-	-								
									GL/GR	-	YL/YR	-	GL/YR	-	-	-								
									GR	-	-	YR	-	-	-	-								
									-	-	-	-	-	-	-	-								
									W	-	-	-	-	-	W	FDW								
									DW	-	-	-	-	-	-	DW								

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING  
**OLIVER STREET & PURCHASE ST**  
**PHASE 1**  
BOSTON PROPER  
INTERSECTION NUMBER 558

DESIGNED BY A. SIU  
DRAWN BY K. CHRONLEY  
CHECKED BY D. MATTON

SCALE: NOT TO SCALE  
DISTRICT: -  
AREA: 13  
DESIGN DATE: OCT. 2009

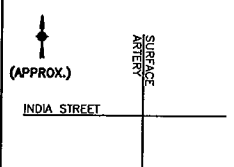





Howard/Stein-Hudson Assoc., Inc.  
38 Chauncy St., 9th Floor  
Boston, MA 02111  
Ph: 617.482.7080  
Fax: 617.482.7417





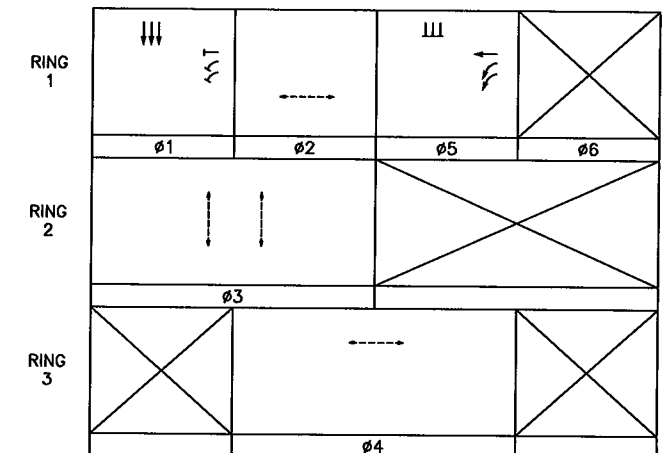




TIMING AND SEQUENCE CHART																						
																		OPERATION FLASHING				
			ø1			ø2			ø3			ø4			ø5							
STREET/DIRECTION/FACE			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL					
SASB/SB/5B,8A,8B			GV	Y	R	R	R	R	R	R	R	R	R	R	R	R	R			FY		
INDIA ST/WB/5A,7A			R	R	R	R	R	R	R	R	R	R	R	R	GL	YL	R			FR		
INDIA ST/WB/8D			R	R	R	R	R	R	R	R	R	R	R	R	GV	Y	R			FR		
C.W./N-S/2E,3F,4E,5E			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW			OFF		
C.W./E-W/3E,4F			DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW			OFF		
C.W./E-W/5F,6E			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW			OFF		
INTERSECTIONS	MINIMUM GREEN		8				-				-				8							
	VEHICLE EXTENSION		2				-				-				2							
	MAXIMUM 1 GREEN		47				-				-				28							
	MAXIMUM 2 GREEN		41				-				-				28							
	YELLOW CLEARANCE			3													3					
	RED CLEARANCE				3					4				6					3			
	WALK INTERVAL					8				8*				8								
	PED. CLEARANCE					8				6**				6**								
MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK							
RECALL (VEH./PED.)			MAX			OFF			PED			OFF			OFF							
PROGRAM/COORDINATION																						
CYCLE NO.		CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																	HOURS OF OPERATION	
				ø1,ø3			ø2,ø3,ø4			ø4,ø5												
1		90	68	38			20			32												
2		100	8	47			20			33												
3		100	48	44			20			36									6:00 A.M. TO 10:00 A.M.			
																			2:30 P.M. TO 7:00 P.M.			
COORDINATED OPERATION																		EVERYDAY				
----																		-----				
----																		-----				
PROGRAMMED FLASH																		EMERGENCY/CONFLICT				
LOOP DETECTOR DATA									CLEARANCES								TECHNICAL NOTES					
IDENT.	QTY.	SIZE	SPLICE	URNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO								* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.				
									G	G	R	-	-	-	W	DW						
									G	G	Y	-	-	-	-	-						
									GL	-	YL	-	-	-	-	-						
									GV	-	Y	-	-	-	-	-						
									R	-	R	-	-	-	-	-						
									-	-	-	-	-	-	-	-						
									W	-	-	-	-	-	W	FDW						
									DW	-	-	-	-	-	-	DW						

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
 DRAWN BY K. CHRONLEY  
 CHECKED BY D. MATTON

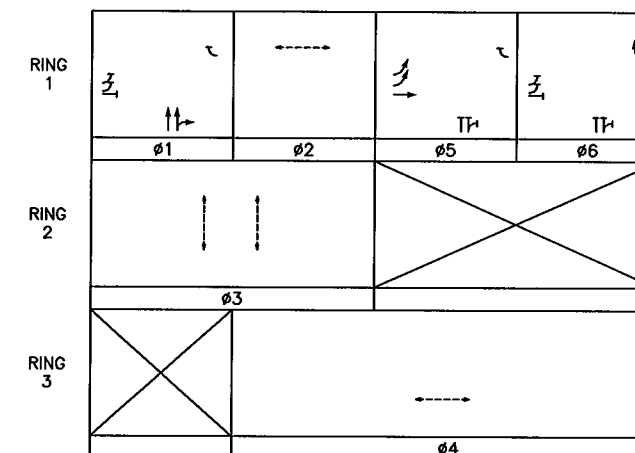
CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING  
**INDIA STREET & SURFACE ARTERY**  
**PHASE 1**  
 BOSTON PROPER  
 INTERSECTION NUMBER 2259  
 SCALE: NOT TO SCALE  
 DISTRICT: --  
 AREA: 13  
 DESIGN DATE: OCT. 2009

Howard/Stein-Hudson Assoc., Inc.  
 38 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Ph: 617.482.7080  
 Fax: 617.482.7417

<div><div><div><div></div><div>↑</div></div><div>(APPROX.)</div></div><div><div>MILK STREET</div><div>ATLANTIC AVENUE</div></div></div>		TIMING AND SEQUENCE CHART																		OPERATION FLASHING	
		ø1			ø2			ø3			ø4			ø5			ø6				
STREET/DIRECTION/FACE		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL		
ATLANTIC/NB/3A,3B,3C		G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY	
MILK ST/EB/4B,4C		R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR	
MILK ST/EB/4A		R	R	R	R	R	R	R	R	R	R	R	R	GL/G	Y	R	R	R	R	FR	
MILK ST/WB/2A,2B		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	GR	YR	R	FR	
C.W./N-S/2E,3F,4F,5F		DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
C.W./E-W/4E,5E		DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF	
C.W./E-W/2F,3E		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
INTERVAL SECONDS	MINIMUM GREEN	8			-			-			-			8			8				
	VEHICLE EXTENSION	2			-			-			-			2			2				
	MAXIMUM 1 GREEN	44			-			-			-			20			11				
	MAXIMUM 2 GREEN	43			-			-			-			24			11				
	YELLOW CLEARANCE		3												3			3			
	RED CLEARANCE			2			4			5			5			2				2	
	WALK INTERVAL				8			8*			8										
	PED. CLEARANCE					7			5**			5**									
	MEMORY	NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK				
RECALL (VEH./PED.)		MAX			OFF			PED			OFF			OFF			OFF				
PROGRAM/COORDINATION																					
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																		
			ø1,ø3			ø2,ø3,ø4			ø4,ø5			ø4,ø6									HOURS OF OPERATION
1	90	14	38			19			17			16									ALL OTHER TIMES
2	100	36	36			19			29			16									6:00 A.M. TO 10:00 A.M.
3	100	33	48			19			18			15									2:30 P.M. TO 7:00 P.M.
COORDINATED OPERATION																					EVERYDAY
----																					-----
----																					-----
PROGRAMMED FLASH																					3:00 A.M. TO 6:00 A.M.
LOOP DETECTOR DATA									CLEARANCES								TECHNICAL NOTES				
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO							* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.				
									G	G	GL/G	R	-	-	W	DW					
									G	G	-	Y	-	-	-	-					
									GL/G	YL/G	GL/G	YL/Y	-	-	-	-					
									GR	-	-	YR	-	-	-	-					
									R	-	-	R	-	-	-	-					
									-	-	-	-	-	-	-	-					
									W	-	-	-	-	-	W	FDW					
									DW	-	-	-	-	-	-	DW					

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
DRAWN BY K. CHRONLEY  
CHECKED BY D. MATTON

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING  
**MILK STREET & ATLANTIC AVE**  
**PHASE 1**  
BOSTON PROPER  
INTERSECTION NUMBER 2006

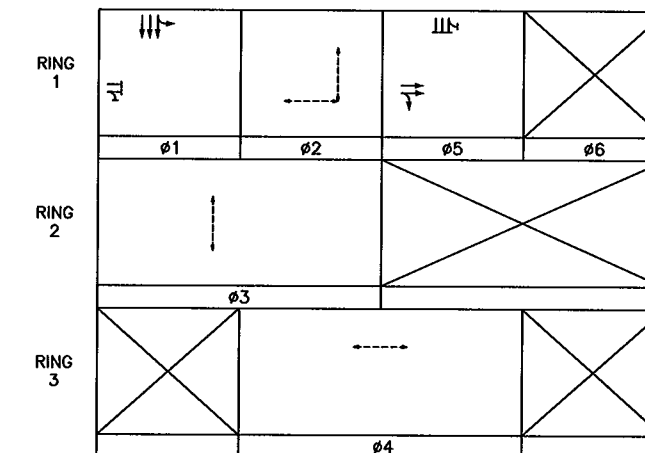
SCALE: NOT TO SCALE  
DISTRICT: -  
AREA: 13  
DESIGN DATE: OCT. 2009

HOWARD/STEIN-HUDSON ASSOCIATES  
Howard/Stein-Hudson Assoc., Inc.  
38 Chauncy St., 9th Floor  
Boston, MA 02111  
Ph: 617.482.7080  
Fax: 617.482.7417

TIMING AND SEQUENCE CHART																				
<div><div><div></div><div>(APPROX.)</div></div><div><div>MILK STREET</div><div>SURFACE ARTERY</div></div></div>																		OPERATION FLASHING		
			ø1			ø2			ø3			ø4			ø5					
STREET/DIRECTION/FACE			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL			
SASB/SB/3C,4A,4B			G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FY		
MILK ST/EB/3A,3B,3D			R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	FR		
C.W./N-S/4F,5F			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF		
C.W./N-S/2F,3E			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF		
C.W./E-W/3F,4E			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF		
C.W./E-W/2E,5E			DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	OFF		
INTERSECTIONS	MINIMUM GREEN		8				-						8							
	VEHICLE EXTENSION		2				-						2							
	MAXIMUM 1 GREEN		51				-						26							
	MAXIMUM 2 GREEN		47				-						29							
	YELLOW CLEARANCE			3										3						
	RED CLEARANCE				2				4				5							
	WALK INTERVAL					8				8*				8						
	PED. CLEARANCE						6				5**				5**					
	MEMORY		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK					
	RECALL (VEH./PED.)		MAX			OFF			PED			OFF			OFF					
PROGRAM/COORDINATION																				
PHASE SPLITS IN SECONDS																				
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	ø1,ø3			ø2,ø3,ø4			ø4,ø5											
1	90	67	41			18			31						HOURS OF OPERATION					
2	100	2	53			18			29						ALL OTHER TIMES					
3	100	36	48			18			34						6:00 A.M. TO 10:00 A.M.					
															2:30 P.M. TO 7:00 P.M.					
COORDINATED OPERATION															EVERYDAY					
----															-----					
----															-----					
PROGRAMMED FLASH															3:00 A.M. TO 6:00 A.M.					
LOOP DETECTOR DATA								CLEARANCES								TECHNICAL NOTES				
IDENT.	QTY.	SIZE	SPLICE	URNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO							* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.			
									G	R	-	-	-	W	DW					
									G	G	Y	-	-	-	-					
									R	-	R	-	-	-	-					
									-	-	-	-	-	-	-					
									-	-	-	-	-	-	-					
									-	-	-	-	-	-	-					
									W	-	-	-	-	W	FDW					
									DW	-	-	-	-	-	DW					

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
 DRAWN BY K. CHRONLEY  
 CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
 38 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Ph: 617.482.7080  
 Fax: 617.482.7417

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING  
**MILK STREET & SURFACE ARTERY**  
**PHASE 1**  
 BOSTON PROPER  
 INTERSECTION NUMBER 1052  
 SCALE: NOT TO SCALE  
 DISTRICT: -  
 AREA: 13  
 DESIGN DATE: OCT. 2009



BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

OPERATION SCHEDULE

LOCATION: State Street and Atlantic Avenue

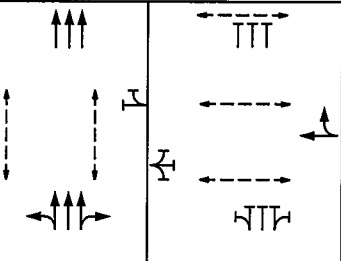
DESIGN DATE: 10/02/2009

INTERSECTION No.: 2023

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 13

PHASE 1

CLEARANCE TABLE																FLASH OPERATION		
TO																		
	G	GV	R	-	W	DW												
FROM	G	G	-	Y	-	-	-											
	GV	-	GV	Y	-	-	-											
	R	-	-	R	-	-	-											
	-	-	-	-	-	-	-											
	W	-	-	-	-	W	FDW											
DW	-	-	-	-	-	-	DW											

STREET	DIR	FACE	Ø1,Ø3			Ø4,Ø5									
ATLANTIC AVE	NB	3A,3B,7A	G	Y	R	R	R	R							FY
ATLANTIC AVE	NB	5A,5B,6A	GV	Y	R	R	R	R							FY
STATE STREET	WB	2A,2B,3C	R	R	R	G	Y	R							FR
CROSSWALK	N/S	2E,3E	W/ FDW	DW	DW	DW	DW	DW							OFF
CROSSWALK	N/S	7F,8E	W/ FDW	DW	DW	DW	DW	DW							OFF
CROSSWALK	E/W	2F,3F,7E,8F	DW	DW	DW	W/ FDW	DW	DW							OFF
WALK TO SEA	E/W	4E,6E	DW	DW	DW	W/ FDW	DW	DW							OFF

TIMING IN SECONDS															
MINIMUM GREEN			8			8									
VEHICLE EXTENSION			2			2									
MAXIMUM #1 GREEN			50			35									
MAXIMUM #2 GREEN			46			44									
YELLOW CLEARANCE				3			3								
RED CLEARANCE					2			2							
WALK INTERVAL			8*			8									
PEDESTRIAN CLEARANCE			5**			5**									
MEMORY			NON-LOCK			NON-LOCK									
RECALL (VEH/PED)			MAX			OFF									

\*Ø1 PED SHALL REST IN WALK

\*\* PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS

COORDINATION INFORMATION (TIMES IN SECONDS)							
CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø5			HOURS OF OPERATION
1	90	41	46	44			ALL OTHER TIMES
2	100	65	51	49			6:00AM - 10:00AM
3	100	40	51	49			2:30PM - 7:00PM
FLASH OPERATION		-	-	-			3:00AM - 6:00AM

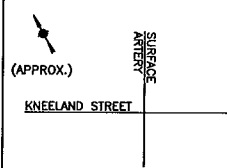












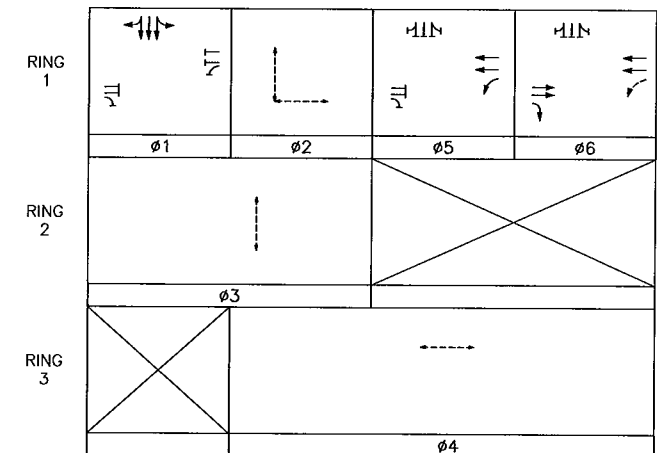
BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS																	
OPERATION SCHEDULE																	
LOCATION: <u>Commercial Street and Cross Street</u>												DESIGN DATE: <u>10/2009</u>					
INTERSECTION No.: <u>290</u>												DATE FIRST IN SERVICE: _____					
SECTION No.: <u>13</u>												PHASE 1					
CLEARANCE TABLE																FLASH OPERATION	
<div>FROM</div>		TO															
		G	GR	GV	R	W	DW										
		G	-	-	Y	-	-										
		GR	-	GR	-	YR	-										
		GV	-	-	GV	Y	-										
		R	-	-	-	R	-										
		W	-	-	-	-	W										
DW	-	-	-	-	-	DW											
STREET		DIR	FACE		Ø1			Ø5									
CROSS STREET		NB	3A,5A,5B		GV	Y	R	R	R	R							FY
COMMERCIAL ST		WB	4A,5C		R	R	R	GR	YR	R							FR
CROSSWALK		N/S	2F,6E		W/ FDW	DW	DW	DW	DW	DW							OFF
CROSSWALK		E/W	2E,3E		DW	DW	DW	W/ FDW	DW	DW							OFF
TIMING IN SECONDS																	
MINIMUM GREEN					8			8									
VEHICLE EXTENSION					2			2									
MAXIMUM #1 GREEN					50			30									
MAXIMUM #2 GREEN					52			45									
YELLOW CLEARANCE						3			3								
RED CLEARANCE							1			1							
WALK INTERVAL					8*			10									
PEDESTRIAN CLEARANCE					5**			5**									
MEMORY					OFF			NON-LOCK									
RECALL (VEH/PED)					MAX			OFF									
*Ø1 PED SHALL REST IN WALK ** PED INDICATIONS SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS																	
COORDINATION INFORMATION (TIMES IN SECONDS)																	
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø5			HOURS OF OPERATION									
1	90		63	45	45			ALL OTHER TIMES									
2	100		73	51	49			6:00AM - 10:00AM									
3	100		43	56	44			2:30PM - 7:00PM									
FLASH OPERATION			-	-	-			3:00AM - 6:00AM									



<div> (APPROX.)</div> <div>KNEELAND STREET</div>		TIMING AND SEQUENCE CHART																		OPERATION FLASHING			
		 LT												 LT			 LT						
		ø1			ø2			ø3			ø4			ø5			ø6						
STREET/DIRECTION/FACE		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL				
SUFRACE/SB/6B,7A,7C		G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY			
KNEELAND/EB/4A,5A,6A,7B		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	FR			
KNEELAND/WB/9B,9C		R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	G	Y	R	FR			
KNEELAND/WB/9A		R	R	R	R	R	R	R	R	R	R	R	R	GL/G	YL/Y	R	G	Y	R	FR			
C.W./N-S/4E,5E		DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF			
C.W./E-W/2E,3E		DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF			
C.W./-/6E,7E,8E,9E		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF			
INTERVAL SECONDS	MINIMUM GREEN	8			-			-			-			4			8						
	VEHICLE EXTENSION	2			-			-			-			2			2						
	MAXIMUM 1 GREEN	38			-			-			-			7			30						
	MAXIMUM 2 GREEN	31			-			-			-			7			32						
	YELLOW CLEARANCE		3												3			3					
	RED CLEARANCE			3			4			6			6			3			3				
	WALK INTERVAL				7			7*			7												
	PED. CLEARANCE					13			9**			7**											
MEMORY		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK						
RECALL (VEH./PED.)		MAX.			OFF			PED			OFF			OFF			MIN						
PROGRAM/COORDINATION																							
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																		HOURS OF OPERATION		
1	90	34	ø1,ø3			ø2,ø3,ø4			ø4,ø5			ø4,ø6											
2	100	67	30			24			11			25						ALL OTHER TIMES					
3	100	4	28			24			10			38						6:00 A.M. TO 10:00 A.M.					
			37			24			13			26						2:30 P.M. TO 7:00 P.M.					
COORDINATED OPERATION																						EVERYDAY	
----																						-----	
----																						-----	
PROGRAMMED FLASH																						3:00 A.M. TO 6:00 A.M.	
LOOP DETECTOR DATA									CLEARANCES								TECHNICAL NOTES						
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO							* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.						
									G	G	GL/G	R	-	-	W	DW							
									G	G	-	Y	-	-	-	-							
									GL/G	YL/G	GL/G	YL/Y	-	-	-	-							
									R	-	-	R	-	-	-	-							
									-	-	-	-	-	-	-	-							
									-	-	-	-	-	-	-	-							
									W	-	-	-	-	-	W	FDW							
									DW	-	-	-	-	-	-	DW							

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
 DRAWN BY A. SIU  
 CHECKED BY D. MATTON

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING  
**KNEELAND STREET & SASB**

**PHASE 1**  
 BOSTON PROPER

INTERSECTION NUMBER 1290

SCALE: NOT TO SCALE  
 DISTRICT: -

AREA: 11  
 DESIGN DATE: OCT. 2009

HOWARD/STEIN-HUDSON ASSOCIATES, INC.  
 38 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Ph: 617.482.7080  
 Fax: 617.482.7417

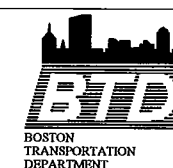
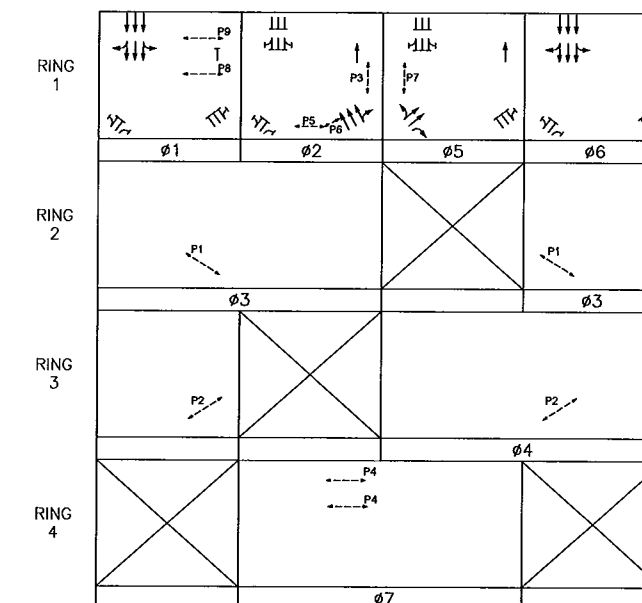




TIMING AND SEQUENCE CHART																									OPERATION FLASHING NO.		
STREET/DIRECTION/FACE	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL			
SASB/SB/4A,10A,13A	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R					FY	
SASB/SB/19A,20A,22A	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R					FY	
ESSEX/EB/2A,3A,4C,6A,10B	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R					FR	
RAMP R-T/NB/16A,16B,18A	R	R	R	G	Y	R	R	R	R	R	R	R	G	Y	R	G	Y	R	R	R	R					FY	
LINCOLN/NB/4B,11A,12A	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R					FR	
C.W./P1/9E,10E	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW					OFF	
C.W./P2/3F,5E	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW					OFF	
C.W./P3/2E,3E	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW				OFF		
C.W./P4/13E,14F,19E,21E	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW				OFF		
C.W./P5/7F,8E	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW				OFF		
C.W./P6/6E,7E	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW				OFF		
C.W./P7/11E,12E	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW				OFF		
C.W./P8/14E,15E	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW				OFF		
C.W./P9/17E,18E	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW				OFF		
INTERSECTIONS	MINIMUM GREEN	8			8								8			5											
	VEHICLE EXTENSION	2			2								2			2											
	MAXIMUM 1 GREEN	20			22								25			5											
	MAXIMUM 2 GREEN	21			22								27			5											
	YELLOW CLEARANCE		3			3							3			3											
	RED CLEARANCE			3			4			7			7				2			7							
	WALK INTERVAL	7			7			7*			7			7					7								
	PED. CLEARANCE	5**			5**			5**			5**			5**					5**								
MEMORY		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK							
RECALL (VEH./PED.)		MAX			OFF			PED			OFF			OFF			MAX			OFF							
PROGRAM/COORDINATION																											
PHASE SPLITS IN SECONDS																											
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	ø1,ø3,ø4			ø2,ø3,ø7			ø4,ø5,ø7			ø3,ø4,ø6															
1	90	21	25			29			26			10												HOURS OF OPERATION			
2	100	59	27			29			34			10												ALL OTHER TIMES			
3	100	98	26			29			35			10												6:00 A.M. TO 10:00 A.M.			
																								2:30 P.M. TO 7:00 P.M.			
COORDINATED OPERATION																								EVERYDAY			
PROGRAMMED FLASH																								EMERGENCY/CONFLICT			
LOOP DETECTOR DATA										CLEARANCES										TECHNICAL NOTES							
IDENT.	QTY.	SIZE	SPICE	URNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO										* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS. - PHASE 4 SHALL BE CONCURRENT AS SHOWN AND SHALL RUN AS AN OVERLAP DURING PHASES 5 & 6 - PHASE 3 SHALL BE CONCURRENT AS SHOWN AND SHALL RUN AS AN OVERLAP DURING PHASES 2 & 6 - PHASE 7 SHALL BE CONCURRENT AS SHOWN AND SHALL RUN AS AN OVERLAP DURING PHASE 2 - P5 AND P6 SHALL DISPLAY DW FOR THE FIRST 3 SECONDS OF PHASE 2							
									G	G	Y	-	-	-	-	-	W	DW									
									R	-	R	-	-	-	-	-	-	-									
									-	-	-	-	-	-	-	-	-	-									
									-	-	-	-	-	-	-	-	-	-									
									-	-	-	-	-	-	-	-	-	-									
									-	-	-	-	-	-	-	-	-	-									
									W	-	-	-	-	-	-	-	W	FDW									
									DW	-	-	-	-	-	-	-	-	DW									

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
DRAWN BY A. SIU  
CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
38 Chauncy St., 9th Floor  
Boston, MA 02111  
Ph: 617.482.7080  
Fax: 617.482.7417

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING

## ESSEX ST. & LINCOLN ST. & SASB

BOSTON PROPER  
INTERSECTION NUMBER 1291

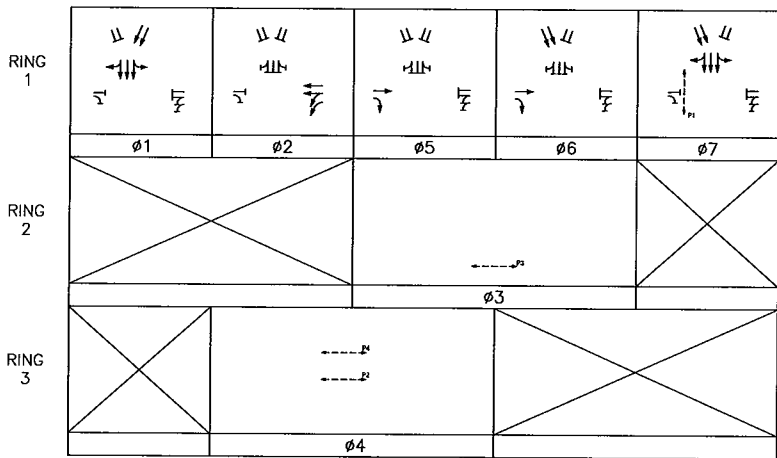
SCALE: NOT TO SCALE  
DISTRICT: —  
AREA: 11  
DESIGN DATE: OCT. 2009



		TIMING AND SEQUENCE CHART																				OPERATION FLASHING NO								
		ø1			ø2			ø5			ø6			ø7			ø4			ø3										
STREET/DIRECTION/FACE		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL								
RAMP R-R/SB/2A,3B,12B		G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				FR				
PURCHASE/SB/7B,8A,10A		G	Y	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R				FY				
PURCHASE/SB/3A,12A,13A		R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R				FR				
SUMMER/EB/6B,7A,10C		R	R	R	R	R	R	G	Y	R	G	Y	R	R	R	R	R	R	R	R	R	R				FR				
SUMMER/WB/5A,6A,9A,10D		R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				FR				
SUMMER/WB/10B		R	R	R	GL	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				FR				
C.W./P1/9E,10E		DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW				OFF				
C.W./P2/4E,11E		DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF				
C.W./P3/7E,8E		DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW				OFF				
C.W./P4/3E,12E		DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF				
INTERVAL	MINIMUM GREEN	10			10			8			1			8			-			-										
	VEHICLE EXTENSION	2			2			2			2			2			-			-										
	MAXIMUM 1 GREEN	20			25			8			1			20			-			-										
	MAXIMUM 2 GREEN	24			29			9			1			22			-			-										
	YELLOW CLEARANCE		3			3			3			3			3															
	RED CLEARANCE			3			4			2			2			3			5			5								
	WALK INTERVAL													7			7													
	PED. CLEARANCE													7**				5**			6**									
MEMORY		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK										
RECALL (VEH./PED.)		MAX			OFF			OFF			OFF			OFF			OFF			OFF										
PROGRAM/COORDINATION																														
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																				HOURS OF OPERATION							
			ø1			ø2,ø4			ø3,ø4,ø5			ø3,ø6			ø7															
			22			21			13			6			28															
			23			36			13			6			22															
3			100			56			30			26			14			6			24						2:30 P.M. TO 7:00 P.M.			
COORDINATED OPERATION																												EVERYDAY		
---																												-----		
---																												-----		
PROGRAMMED FLASH																												EMERGENCY/CONFLICT		
LOOP DETECTOR DATA									CLEARANCES									TECHNICAL NOTES												
IDENT.	QTY.	SIZE	SPUCE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO								** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.												
									G	G	R	-	-	-	-	-	W											DW		
									G	G	Y	-	-	-	-	-	-											-		
									GL	-	YL	-	-	-	-	-	-											-		
									R	-	R	-	-	-	-	-	-											-		
									-	-	-	-	-	-	-	-	-											-		
									-	-	-	-	-	-	-	-	-	-												
									W	-	-	-	-	-	-	-	W	FDW												
									DW	-	-	-	-	-	-	-	-	DW												

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
DRAWN BY A. SIU  
CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
38 Chauncy St., 9th Floor  
Boston, MA 02111  
Ph: 617.482.7080  
Fax: 617.482.7417

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING

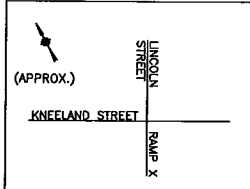
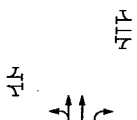


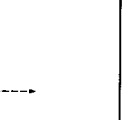
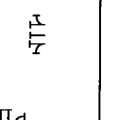
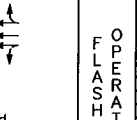
## SUMMER ST. & PURCHASE ST.

BOSTON PROPER  
INTERSECTION NUMBER 3012

SCALE: NOT TO SCALE  
DISTRICT: -

AREA: 11  
DESIGN DATE: OCT. 2009

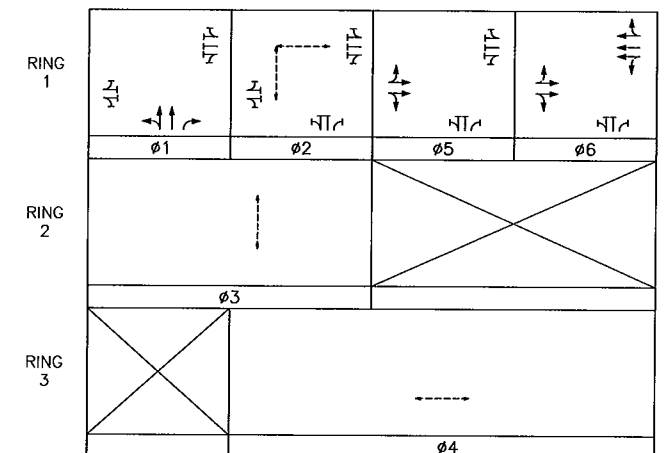


<div></div> (APPROX.)		TIMING AND SEQUENCE CHART																		OPERATION FLASHING	
																					
		ø1			ø2			ø3			ø4			ø5			ø6				
STREET/DIRECTION/FACE		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL		
RAMP X/NB/4A		G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY	
RAMP X/NB/4B		GL	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY	
KNEELAND ST/EB/6A		R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	G	Y	R	FR	
KNEELAND ST/EB/6B		R	R	R	R	R	R	R	R	R	R	R	R	GL/G	YL/Y	R	G	Y	R	FR	
KNEELAND ST/WB/3A,3B		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	FR	
C.W./P1/5E,6E		DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
C.W./P2/2F,7E		DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF	
C.W./P3/2E,3E,3F,4E		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
INTERVALS	MINIMUM GREEN	8			-			-			-			8			8				
	VEHICLE EXTENSION	2			-			-			-			2			2				
	MAXIMUM 1 GREEN	33			-			-			-			12			24				
	MAXIMUM 2 GREEN	24			-			-			-			12			24				
	YELLOW CLEARANCE		3												3			3			
	RED CLEARANCE			3			4			6			6			3			3		
	WALK INTERVAL				7			7*			7										
	PED. CLEARANCE					11			9**			8**									
MEMORY		NON-LOCK			LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK				
RECALL (VEH./PED.)		MAX			OFF			PED			OFF			OFF			OFF				
PROGRAM/COORDINATION																					
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																		
			ø1,ø3			ø2,ø3,ø4			ø4,ø5			ø4,ø6									HOURS OF OPERATION
1	90	43	24			22			18			26									ALL OTHER TIMES
2	100	59	32			22			16			30									6:00 A.M. TO 10:00 A.M.
3	100	14	30			22			19			29									2:30 P.M. TO 7:00 P.M.
COORDINATED OPERATION																					
----																					
----																					
PROGRAMMED FLASH																					
																					3:00 A.M. TO 6:00 A.M.

LOOP DETECTOR DATA									CLEARANCES								TECHNICAL NOTES	
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO							* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.	
									G	GL	GL/G	R	-	W	DW			
									G	G	-	-	Y	-	-	-		
									GL	-	GL	-	Y	-	-	-		
									GL/G	YL/G	GL/Y	GL/G	YL/Y	-	-	-		
									R	-	-	-	R	-	-	-		
									-	-	-	-	-	-	-	-		
									W	-	-	-	-	-	W	FDW		
									DW	-	-	-	-	-	-	DW		

S/P = SERIES/PARALLEL

### PHASING DIAGRAM



DESIGNED BY A. SIU  
 DRAWN BY A. SIU  
 CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
 36 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Ph: 617.482.7080  
 Fax: 617.482.7417

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING  
**KNEELAND ST. & LINCOLN ST.**

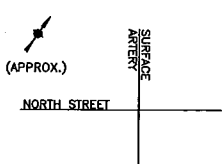
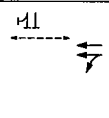


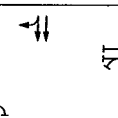
**PHASE 1**

BOSTON PROPER

INTERSECTION NUMBER 403

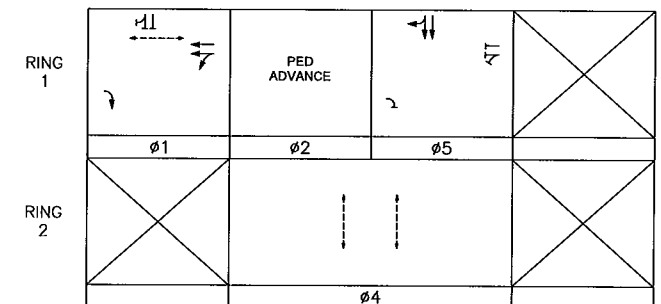
SCALE: NOT TO SCALE  
 DISTRICT: -

AREA: 11  
 DESIGN DATE: OCT. 2009

TIMING AND SEQUENCE CHART																											
<div></div> <div>(APPROX.) NORTH STREET</div>			<div></div> <div>ø1</div>			<div></div> <div>ø2</div>			<div></div> <div>ø4</div>			<div></div> <div>ø5</div>						OPERATION FLASHING									
			STREET/DIRECTION/FACE	GRN	CL	CL	GRN			GRN	CL	CL	GRN	CL	CL												
NORTH ST/EB/4A,4B			GR	Y	R	R			R	R	R	R	R	R				FR									
RAMP CN-SA/WB/3A,7B			G	Y	R	R			R	R	R	R	R	R				FR									
RAMP CN-SA/WB/6A			GL	Y	R	R			R	R	R	R	R	R				FR									
RAMP CN-SA/WB/7A			GV	Y	R	R			R	R	R	R	R	R				FR									
SURFACE/SB/5A			R	R	R	R			R	R	R	GV	Y	R				FY									
SURFACE/SB/5B			R	R	R	R			R	R	R	G	Y	R				FY									
C.W./E-W/2F,8E			W/FDW	DW	DW	DW			DW	DW	DW	DW	DW	DW				OFF									
C.W./N-S/3E,4E,6E,7E			DW	DW	DW	W			W	FDW	DW	DW	DW	DW				OFF									
INTERVALS	MINIMUM GREEN		10			-				-				10													
	VEHICLE EXTENSION		2			-				-				2													
	MAXIMUM 1 GREEN		45			-				-				40													
	MAXIMUM 2 GREEN		47			-				-				40													
	YELLOW CLEARANCE			3									3														
	RED CLEARANCE				2							5			2												
	WALK INTERVAL		10*			4			7																		
	PED. CLEARANCE		5**						10**																		
MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK															
RECALL (VEH./PED.)			MAX			OFF			OFF			OFF															
PROGRAM/COORDINATION																											
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																								
			ø1			ø2,ø4			ø4,ø5																		
1	90	89	50			4			36						HOURS OF OPERATION												
2	100	24	52			4			44						ALL OTHER TIMES												
3	100	54	51			4			45						6:00 A.M. TO 10:00 A.M.												
															2:30 P.M. TO 7:00 P.M.												
COORDINATED OPERATION															EVERYDAY												
---															-----												
---															-----												
PROGRAMMED FLASH															EMERGENCY ONLY												
LOOP DETECTOR DATA									CLEARANCES								TECHNICAL NOTES										
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	G	GL	GV	GR	R	W	DW	* ø1 PED SHALL REST IN WALK										
									G	G	-	-	-	Y	-	-	** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE										
									GL	-	GL	-	-	Y	-	-	YELLOW AND RED CLEARANCE INTERVALS.										
									GV	-	-	GV	-	Y	-	-											
									GR	-	-	-	GR	Y	-	-											
									R	-	-	-	-	R	-	-											
									W	-	-	-	-	-	W	FDW											
									DW	-	-	-	-	-	-	DW											

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU

DRAWN BY A. SIU

CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
35 Chauncy St., 9th Floor  
Boston, MA 02111  
Ph: 617.482.7080  
Fax: 617.482.7417

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING  
**NORTH ST. & SURFACE ARTERY**  
**PHASE 1**  
BOSTON PROPER  
INTERSECTION NUMBER 7000

SCALE: NOT TO SCALE

DISTRICT: -

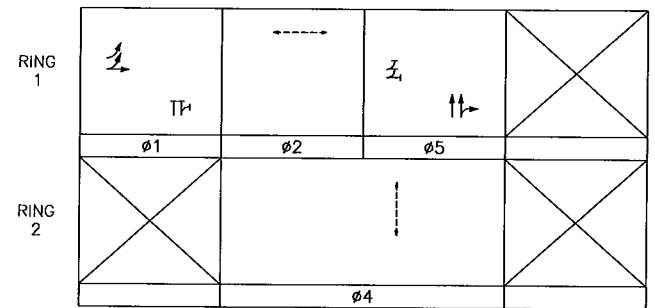
AREA: GC

DESIGN DATE: OCT. 2009

TIMING AND SEQUENCE CHART																										
															OPERATION FLASHING											
			ø1			ø2			ø4							ø5										
STREET/DIRECTION/FACE			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL												
RAMP CN-SA/EB/2A			GV	Y	R	R	R	R	R	R	R	R	R	R						FR						
RAMP CN-SA/EB/2B			GV/GL	Y	R	R	R	R	R	R	R	R	R	R						FR						
RAMP CN-SA/EB/4C			G	Y	R	R	R	R	R	R	R	R	R	R						FR						
CROSS ST/NB/4A			R	R	R	R	R	R	R	R	R	G	Y	R						FY						
CROSS ST/NB/4B			R	R	R	R	R	R	R	R	R	GV	Y	R						FY						
C.W./N-S/2F,3E			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW						OFF						
C.W./E-W/2E,4E			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW						OFF						
INTERVAL SECONDS	MINIMUM GREEN		8				-				-				8											
	VEHICLE EXTENSION		2				-				-				2											
	MAXIMUM 1 GREEN		45				-				-				35											
	MAXIMUM 2 GREEN		42				-				-				39											
	YELLOW CLEARANCE			3							3															
	RED CLEARANCE				2			4			5			2												
	WALK INTERVAL					7			7																	
	PED. CLEARANCE						6			5**																
MEMORY			NON-LOCK			LOCK			NON-LOCK			NON-LOCK														
RECALL (VEH./PED.)			MAX			OFF			OFF			OFF														
PROGRAM/COORDINATION																										
CYCLE NO.		CYCLE LENGTH		OFFSET (SEC.)		PHASE SPLITS IN SECONDS															HOURS OF OPERATION					
						ø1			ø2,ø4			ø4,ø5														
1		90		88		39			17			34														
2		100		0		47			17			36														
3		100		83		39			17			44														
COORDINATED OPERATION																										
----																		EVERYDAY								
----																		-----								
PROGRAMMED FLASH																		3:00 A.M. TO 6:00 A.M.								
LOOP DETECTOR DATA									CLEARANCES								TECHNICAL NOTES									
IDENT.	QTY.	SIZE	SPLICE	URNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO							** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.									
									G	GL/GV	GV	R	-	W	DW											
									G	G	-	-	Y	-	-	-										
									GL/GV	-	GL/GV	-	Y	-	-	-										
									GV	-	-	GV	Y	-	-	-										
									R	-	-	-	R	-	-	-										
									-	-	-	-	-	-	-	-										
									W	-	-	-	-	-	W	FDW										
									DW	-	-	-	-	-	-	DW										

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING  
**NORTH STREET & CROSS STREET**  
**PHASE 1**  
BOSTON PROPER  
INTERSECTION NUMBER 1961  
SCALE: NOT TO SCALE  
DISTRICT: -  
AREA: GC  
DESIGN DATE: OCT. 2009

DESIGNED BY A. SIU  
DRAWN BY A. SIU  
CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
38 Chauncy St., 9th Floor  
Boston, MA 02111  
Ph: 617.482.7080  
Fax: 617.482.7417

<div><div><div><div></div><div>(APPROX.)</div></div><div><div>HANOVER STREET</div><div>SURFACE AVENUE</div></div></div></div>		TIMING AND SEQUENCE CHART																	OPERATION FLASHING		
																	PED ADVANCE				
		ø1			ø3			ø4			ø5			ø6			ø8				
STREET/DIRECTION/FACE		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN				
SURFACE/SB/2A,2B		G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R			FY	
HANOVER/EB/5A,5B		R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R			FR	
HANOVER/WB/3B		R	R	R	R	R	R	R	R	R	G	Y	R	G	Y	R	R			FR	
HANOVER/WB/3A		R	R	R	R	R	R	R	R	R	GL/G	YL/Y	R	G	Y	R	R			FR	
C.W./N-S/2F,3E,4F,5E		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W			OFF	
C.W./E-W/3F,4E		DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW			OFF	
C.W./E-W/2E,5E		DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	DW			OFF	
INTERVALS	MINIMUM GREEN	10			-			-			10			10			-				
	VEHICLE EXTENSION	2			-			-			2			2			-				
	MAXIMUM 1 GREEN	35			-			-			20			25			-				
	MAXIMUM 2 GREEN	34			-			-			21			26			-				
	YELLOW CLEARANCE		3									3			3						
	RED CLEARANCE			2			5			5			2			2					
	WALK INTERVAL				14*			8						12			4				
	PED. CLEARANCE					8**			5**					5**							
MEMORY		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK				
RECALL (VEH./PED.)		MAX			PED			OFF			OFF			OFF			MAX				



BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

OPERATION SCHEDULE

LOCATION: Hanover Street and Cross Street

INTERSECTION No.: 4096

SECTION No.: GC

DESIGN DATE: 10/2009

DATE FIRST IN SERVICE: \_\_\_\_\_

PHASE 1

CLEARANCE TABLE							
		TO					
		G	GV	GV/GR	R	W	DW
FROM	G	G	-	-	Y	-	-
	GV	-	GV	-	Y	-	-
	GV/GR	-	-	GV/GR	Y	-	-
	R	-	-	-	R	-	-
	W	-	-	-	-	W	FDW
	DW	-	-	-	-	-	DW

STREET		DIR	FACE		Ø1,Ø3			Ø4,Ø5									
CROSS STREET		NB	2C,3A,3B		G	Y	R	R	R	R							FY
HANOVER ST		EB	5A		R	R	R	G	Y	R							FR
HANOVER ST		EB	5B		R	R	R	GV	Y	R							FR
HANOVER ST		WB	2A,2B		R	R	R	GV/GR	Y	R							FR
CROSSWALK		N/S	2F,4E,5F,6F		W/ FDW	DW	DW	DW	DW	DW							OFF
CROSSWALK		E/W	2E,3E,5E,6E		DW	DW	DW	W/ FDW	DW	DW							OFF

TIMING IN SECONDS

MINIMUM GREEN	8			8												
VEHICLE EXTENSION	2			2												
MAXIMUM #1 GREEN	55			32												
MAXIMUM #2 GREEN	61			34												
YELLOW CLEARANCE		3			3											
RED CLEARANCE			2			2										
WALK INTERVAL	15*			8												
PEDESTRIAN CLEARANCE	7**			8**												
MEMORY	LOCK		NON-LOCK													
RECALL (VEH/PED)	MAX		OFF													

\*Ø1 PED SHALL REST IN WALK

\*\* PED INCIATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS

COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø5			HOURS OF OPERATION
1	90	74	51	39			ALL OTHER TIMES
2	100	82	62	38			6:00AM - 10:00AM
3	100	56	66	34			2:30PM - 7:00PM
FLASH OPERATION		-	-	-			3:00AM - 6:00AM

## OPERATION SCHEDULE

DESIGN DATE: 10/2009

DATE FIRST IN SERVICE: \_\_\_\_\_

## PHASE 1

CLEARANCE TABLE														FLASH OPERATION		
		TO														
		G	GV	GR	R	W	DW									
FROM	G	-	-	-	Y	-	-									
	GV	-	GV	-	Y	-	-									
	GR	-	-	GR	Y	-	-									
	R	-	-	-	R	-	-									
W	-	-	-	-	W	FDW										
DW	-	-	-	-	-	DW										
STREET		DIR	FACE		Ø1			Ø3			Ø4					
NEW SUDBURY		EB	5A		GV	Y	R	R	R	R	R	R				FR
NEW SUDBURY		EB	5B		G	Y	R	R	R	R	R	R				FR
SASB		SB	3A		R	R	R	GV	Y	R	R	R				FY
SASB		SB	3B		R	R	R	G	Y	R	R	R				FY
MBTA DRIVEWAY		SB	2A,3C		R	R	R	R	R	R	GR	Y	R			FR
CROSSWALK		E/W	3E,5F,6E,8F		W/FDW	DW	DW	DW	DW	DW	DW	DW				OFF
CROSSWALK		N/S	4E,5E,7E,8E		DW	DW	DW	W/FDW	DW	DW	DW	DW				OFF
TIMING IN SECONDS																
MINIMUM GREEN					10			10			6					
VEHICLE EXTENSION					2			2			2					
MAXIMUM #1 GREEN					27			35			19					
MAXIMUM #2 GREEN					34			41			25					
YELLOW CLEARANCE						3			3			3				
RED CLEARANCE							2			3			2			
WALK INTERVAL					8*			8								
PEDESTRIAN CLEARANCE					8**			5**								
MEMORY					NON-LOCK			NON-LOCK			NON-LOCK					
RECALL (VEH/PED)					MAX/PED			OFF			OFF					
*Ø1 PED SHALL REST IN WALK ** PED INCIATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS																
COORDINATION INFORMATION (TIMES IN SECONDS)																
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø3		Ø4					HOURS OF OPERATION				
1	90		80	33	35		22					ALL OTHER TIMES				
2	100		27	23	47		30					6:00AM - 10:00AM				
3	100		22	39	41		20					2:30PM - 7:00PM				
FLASH OPERATION			-	-	-		-					EMERGENCY/CONFLICT				

## OPERATION SCHEDULE

DESIGN DATE: 10/2009

DATE FIRST IN SERVICE: \_\_\_\_\_

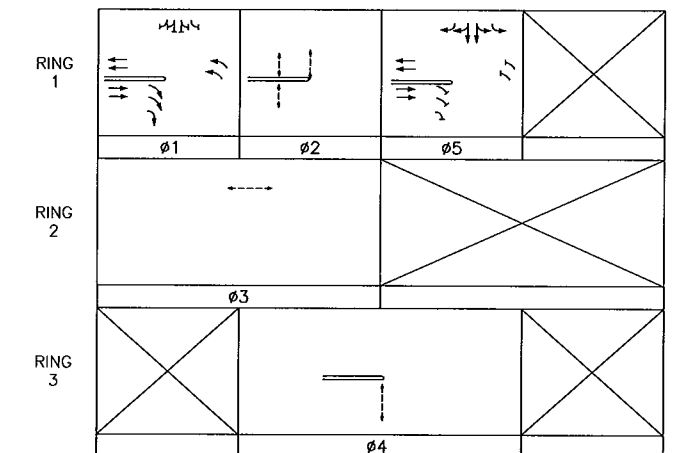
## PHASE 1

CLEARANCE TABLE																				FLASH OPERATION		
		TO																				
FROM	G	G	GSL	GV	R	W	DW															
	GSL	-	GSL	-	Y	-	-															
	GV	-	-	GV	Y	-	-															
	R	-	-	-	R	-	-															
	W	-	-	-	-	W	FDW															
DW	-	-	-	-	-	-	DW															
STREET			DIR	FACE			Ø1			Ø2			Ø5									
NEW SUDBURY			EB	3A			GL	Y	R	GL	Y	R	R	R	R				FR			
NEW SUDBURY			EB	4D,10A			GSL	Y	R	GSL	Y	R	R	R	R				FR			
CROSS STREET			NB	4A			R	R	R	R	R	R	GSL	Y	R				FY			
CROSS STREET			NB	4B,4C			R	R	R	R	R	R	GV	Y	R				FY			
CROSS STREET			NB	8C			R	R	R	G	Y	R	G	Y	R				FY			
CROSS STREET			NB	8A,8B			R	R	R	GV	Y	R	GV	Y	R				FY			
CROSSWALK			E/W	5E,6E,7E,9E			W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW				OFF			
CROSSWALK			N/S	2E,10E			DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW				OFF			
TIMING IN SECONDS																						
MINIMUM GREEN							10			4			10									
VEHICLE EXTENSION							2			2			2									
MAXIMUM #1 GREEN							24			18			41									
MAXIMUM #2 GREEN							26			19			49									
YELLOW CLEARANCE								3			3			3								
RED CLEARANCE									2			2			2							
WALK INTERVAL							12*						8									
PEDESTRIAN CLEARANCE							5**						5**									
MEMORY							NON-LOCK			NON-LOCK			NON-LOCK									
RECALL (VEH/PED)							MAX/PED			OFF			OFF									
*Ø1 PED SHALL REST IN WALK ** PED INCIATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS																						
COORDINATION INFORMATION (TIMES IN SECONDS)																						
CYCLE	CYCLE LENGTH			OFFSET	Ø1	Ø2	Ø5				HOURS OF OPERATION											
1	90			18	31	22	37				ALL OTHER TIMES											
2	100			35	31	23	46				6:00AM - 10:00AM											
3	100			17	26	20	54				2:30PM - 7:00PM											
FLASH OPERATION				-	-	-	-				EMERGENCY/CONFLICT											

TIMING AND SEQUENCE CHART																					
																		OPERATION FLASHING			
			ø1			ø2			ø3			ø4			ø5						
STREET/DIRECTION/FACE			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL				
NEW CHARDON/EB/5A,6A			GR	Y	R	R	R	R	R	R	R	R	R	R	R	R	R			FY	
NEW CHARDON/EB/11D			GSR	Y	R	R	R	R	R	R	R	R	R	R	R	R	R			FY	
RAMP ST-SA/WB/2A,2B,3B			GV	Y	R	R	R	R	R	R	R	R	R	R	R	R	R			FY	
N.WASHINGTON/SB/3A,11A,11B			R	R	R	R	R	R	R	R	R	R	R	R	GSL	Y	R			FR	
N.WASHINGTON/SB/11C			R	R	R	R	R	R	R	R	R	R	R	R	GR	Y	R			FR	
NEW CHARDON/EB/10A,10B			G	Y	R	R	R	R	R	R	R	R	R	R	G	Y	R			FY	
NEW CHARDON/WB/13A,13B			GV	Y	R	R	R	R	R	R	R	R	R	R	GV	Y	R			FY	
C.W./N-S/9E,11F			DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW			OFF	
C.W./N-S/2E,7E,8E,11E,12E,14E			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW			OFF	
C.W./E-W/2F,3E			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW			OFF	
INTERSECTIONS IN SECONDS	MINIMUM GREEN	8				-						-			8						
	VEHICLE EXTENSION	2													2						
	MAXIMUM 1 GREEN	42													31						
	MAXIMUM 2 GREEN	38													38						
	YELLOW CLEARANCE		3													3					
	RED CLEARANCE			3				4				6					3				
	WALK INTERVAL				8						8*				8						
	PED. CLEARANCE							15				7**				8**					
MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK						
RECALL (VEH./PED.)			MAX			OFF			PED			OFF			OFF						
PROGRAM/COORDINATION																					
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																		HOURS OF OPERATION
			ø1,ø3			ø2,ø3,ø4			ø4,ø5									ALL OTHER TIMES			
			31			27			32												
			29			27			44												
3			100			76			44			27			29			2:30 P.M. TO 7:00 P.M.			
COORDINATED OPERATION																		EVERYDAY			
----																		-----			
----																		-----			
PROGRAMMED FLASH																		EMERGENCY/CONFLICT			
LOOP DETECTOR DATA										CLEARANCES								TECHNICAL NOTES			
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	G	GSR	GSL	GV	GR	R	W	DW	* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1			
									G	G	-	-	-	-	Y	-	-	** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.			
									GSR	-	GSR	-	-	-	Y	-	-				
									GSL	-	-	GSL	-	-	Y	-	-				
									GV	-	-	-	GV	-	Y	-	-				
									GR	-	-	-	-	GR	Y	-	-				
									R	-	-	-	-	-	R	-	-				
									W	-	-	-	-	-	-	W	FDW				
									DW	-	-	-	-	-	-	-	DW				

S/P = SERIES/PARALLEL

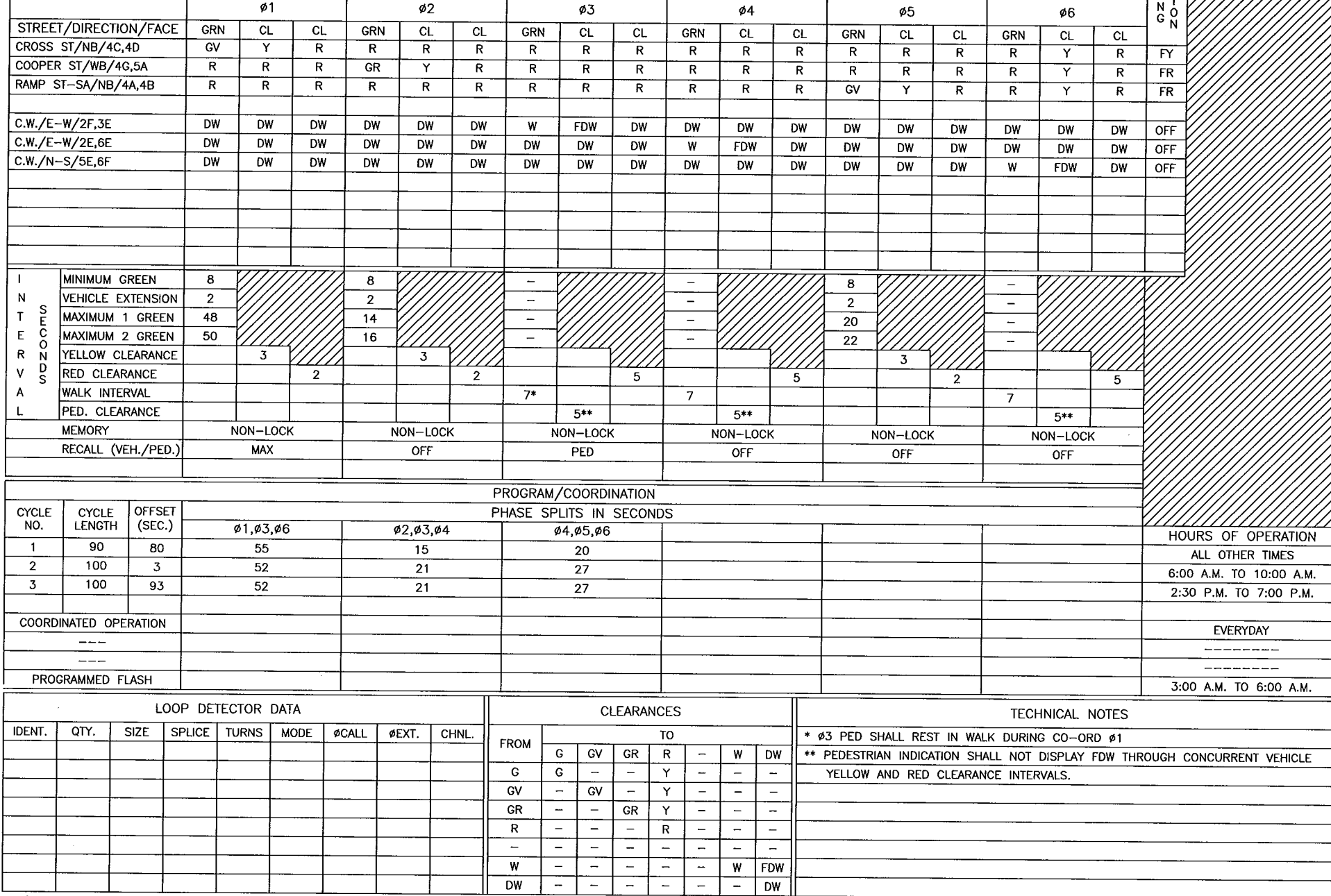
## PHASING DIAGRAM




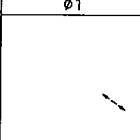
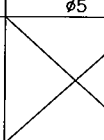
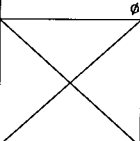
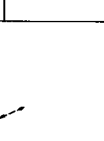
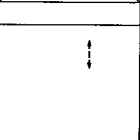
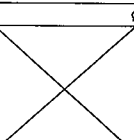



DESIGNED BY A. SIU  
 DRAWN BY A. SIU  
 CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
 38 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Ph: 617.482.7080  
 Fax: 617.482.7417

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING  
**NEW CHARDON ST. & N. WASHINGTON ST.**  
**PHASE 1**  
 BOSTON PROPER  
 INTERSECTION NUMBER 1862  
 SCALE: NOT TO SCALE  
 DISTRICT: -  
 AREA: GC  
 DESIGN DATE: OCT. 2009



RING 1			
	Ø1	Ø2	Ø5
RING 2			
	Ø3		
RING 3			
		Ø4	
RING 4			
	Ø6		Ø6

S/P = SERIES/PARALLEL

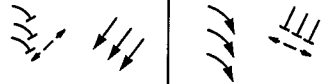
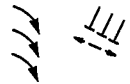


DESIGNED BY A. SIU  
DRAWN BY A. SIU  
CHECKED BY D. MATTON

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING  
**COOPER ST. & CROSS STREET**  
**PHASE 1**  
BOSTON PROPER  
INTERSECTION NUMBER 34

SCALE: NOT TO SCALE                      AREA: GC  
DISTRICT: -                                  DESIGN DATE: OCT. 2009

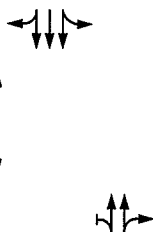
**HOWARD  
STEIN  
HUDSON  
ASSOCIATES** Howard/Stein-Hudson Assoc., Inc.  
38 Chauncy St., 9th Floor  
Boston, MA 02111  
Ph: 617.482.7080  
Fax: 617.482.7417

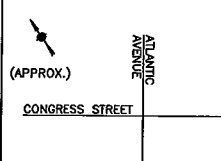

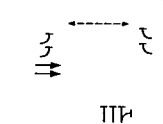

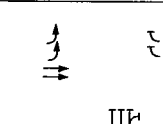
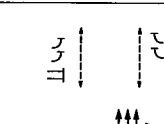
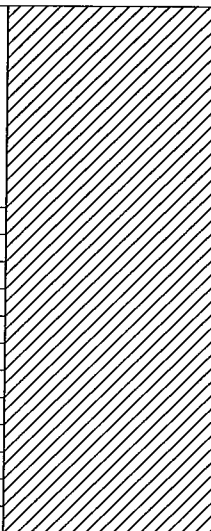
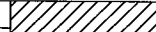

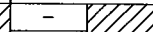
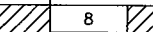

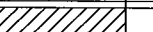
BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS																			
OPERATION SCHEDULE																			
LOCATION: <u>North Washington Street and Beverly Street</u>												DESIGN DATE: <u>10/2009</u>							
INTERSECTION No.: <u>4120</u>												DATE FIRST IN SERVICE: _____							
SECTION No.: <u>GC</u>																			
PHASE 1																			
CLEARANCE TABLE																		FLASH OPERATION	
		TO																	
	-	GV	GSR	R	W	DW													
FROM	-	-	-	-	Y	-	-												
	GV	-	GV	-	Y	-	-												
	GSR	-	-	GSR	Y	-	-												
	R	-	-	-	R	-	-												
	W	-	-	-	-	W	FDW												
DW	-	-	-	-	-	DW													
STREET		DIR	FACE		Ø1			Ø5											
N. WASHINGTON		SB	2A,3A,3B		GV	Y	R	R	R	R							FY		
BEVERLY ST		EB	3C,3D,5A		R	R	R	GSR	Y	R							FR		
CROSSWALK		N/S	4E,5E		W/ FDW	DW	DW	DW	DW	DW							OFF		
CROSSWALK		E/W	2E,5F		DW	DW	DW	W/ FDW	DW	DW							OFF		
TIMING IN SECONDS																			
MINIMUM GREEN					8			8											
VEHICLE EXTENSION					2			2											
MAXIMUM #1 GREEN					35			35											
MAXIMUM #2 GREEN					50			42											
YELLOW CLEARANCE						3			3										
RED CLEARANCE							2			2									
WALK INTERVAL					7*			7											
PEDESTRIAN CLEARANCE					5**			9**											
MEMORY					NON-LOCK			LOCK											
RECALL (VEH/PED)					MAX			OFF											
*Ø1 PED SHALL REST IN WALK ** PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS																			
COORDINATION INFORMATION (TIMES IN SECONDS)																			
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø5			HOURS OF OPERATION											
1	90		83	43	47			ALL OTHER TIMES											
2	100		11	55	45			6:00AM - 10:00AM											
3	50		46	23	27			2:30PM - 7:00PM											
FLASH OPERATION			-	-	-			3:00AM - 6:00AM											

## OPERATION SCHEDULE

SECTION No.: GC

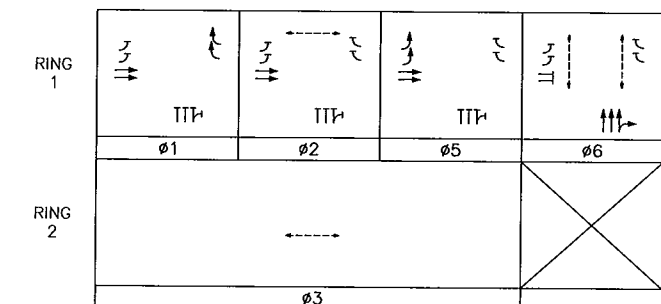
## PHASE 1

CLEARANCE TABLE																	FLASH OPERATION	
		TO																
		FROM	G	GL	RL	R	W	DW										
	G	G			Y	-	-											
	GL	-	GL	YL	-	-	-											
	RL	-	-	RL	-	-	-											
	R	-	-	-	R	-	-											
	W	-	-	-	-	W	FDW											
	DW	-	-	-	-	-	DW											
STREET		DIR		FACE			Ø1			Ø5								
N. WASHINGTON		NB		3B,3C			G	Y	R	R	R	R						FY
N. WASHINGTON		NB		3A			RL	RL	RL	GL	YL	RL						FRL
N. WASHINGTON		SB		4A,4B,4C			G	Y	R	R	R	R						FY
CROSSWALK		N/S		4E,5E			W/ FDW	DW	DW	DW	DW	DW						OFF
CROSSWALK		E/W		2E,6E			DW	DW	DW	W/ FDW	DW	DW						OFF
TIMING IN SECONDS																		
MINIMUM GREEN							10			8								
VEHICLE EXTENSION							2			2								
MAXIMUM #1 GREEN							63			24								
MAXIMUM #2 GREEN							69			29								
YELLOW CLEARANCE								3		3								
RED CLEARANCE									2		2							
WALK INTERVAL							7*			7								
PEDESTRIAN CLEARANCE							8**			13**								
MEMORY							NON-LOCK			NON-LOCK								
RECALL (VEH/PED)							MAX			OFF								
*Ø1 PED SHALL REST IN WALK																		
** PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS																		
COORDINATION INFORMATION (TIMES IN SECONDS)																		
CYCLE	CYCLE LENGTH			OFFSET	Ø1	Ø5					HOURS OF OPERATION							
1	90			24	64	26					ALL OTHER TIMES							
2	100			92	66	34					6:00AM - 10:00AM							
3	100			17	74	26					2:30PM - 7:00PM							
FLASH OPERATION				-	-	-					3:00AM - 6:00AM							

TIMING AND SEQUENCE CHART																															
<div></div>																		OPERATION FLASHING	<div></div>												
			TTL			TTL			TTL			TTL																			
			Ø1			Ø2			Ø3			Ø5			Ø6																
STREET/DIRECTION/FACE			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL														
CONGRESS/EB/4A			G	Y	R	G	Y	R	R	R	R	G	Y	R	R	R	R			FR											
CONGRESS/EB/9B,9C			GV	Y	R	GV	Y	R	R	R	R	GV	Y	R	R	R	R			FR											
CONGRESS/EB/6C,9A			RL	RL	RL	RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL			FRL											
CONGRESS/WB/6A,6D,8A			GR	YR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR			FRR											
ATLANTIC/NB/2A,6B,7A			R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R			FY											
C.W./E-W/2E,3E			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW			OFF											
C.W./E-W/6E,7E			DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW			OFF											
C.W./N-S/4E,5E,8E,9E			DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW			OFF											
INTERSECTIONS	MINIMUM GREEN		8	<div></div>			8	<div></div>			-	<div></div>			8	<div></div>			8	<div></div>				<div></div>							
	VEHICLE EXTENSION		2				2				-				2				2												
	MAXIMUM 1 GREEN		17				14				-				19				26												
	MAXIMUM 2 GREEN		17				15				-				25				32												
	YELLOW CLEARANCE			3				3								3				3											
	RED CLEARANCE				2				2				5				2				3										
	WALK INTERVAL					8				8*								8													
	PED. CLEARANCE					5**				7**								7**													
MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK																
RECALL (VEH./PED.)			MAX			OFF			PED			OFF			OFF																
PROGRAM/COORDINATION																															
PHASE SPLITS IN SECONDS																															
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	Ø1,Ø3			Ø2,Ø3			Ø3,Ø5			Ø6																			
1	90	65	22			20			21			27																			
2	100	19	22			19			21			38																			
3	100	76	21			19			30			30																			
COORDINATED OPERATION																															
----																															
----																															
PROGRAMMED FLASH																															
LOOP DETECTOR DATA																	CLEARANCES										TECHNICAL NOTES				
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	ØCALL	ØEXT.	CHNL.	FROM	TO										* Ø3 PED SHALL REST IN WALK DURING CO-ORD Ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.											
									G	GV	GL	GR	R	RL	RR	W	DW														
									G	-	-	-	Y	-	-	-	-														
									GV	-	GV	-	-	Y	-	-	-														
									GL	-	-	GL	-	-	YL	-	-														
									GR	-	-	-	GR	-	-	YR	-														
									R	-	-	-	-	R	-	-	-														
									RL	-	-	-	-	-	RL	-	-														
									RR	-	-	-	-	-	-	RR	-														
									W	-	-	-	-	-	-	W	FDW														
									DW	-	-	-	-	-	-	-	DW														

S/P = SERIES/PARALLEL

## PHASING DIAGRAM

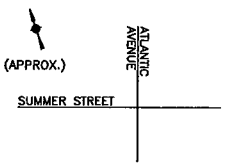
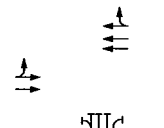
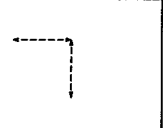
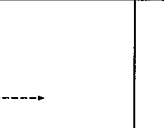

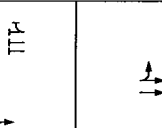



DESIGNED BY A. SIU  
 DRAWN BY A. SIU  
 CHECKED BY D. MATTON

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING  
**CONGRESS ST. & ATLANTIC AVE.**  
 BOSTON PROPER  
 INTERSECTION NUMBER 3056  
 SCALE: NOT TO SCALE  
 DISTRICT: -  
 AREA: 13  
 DESIGN DATE: OCT. 2009

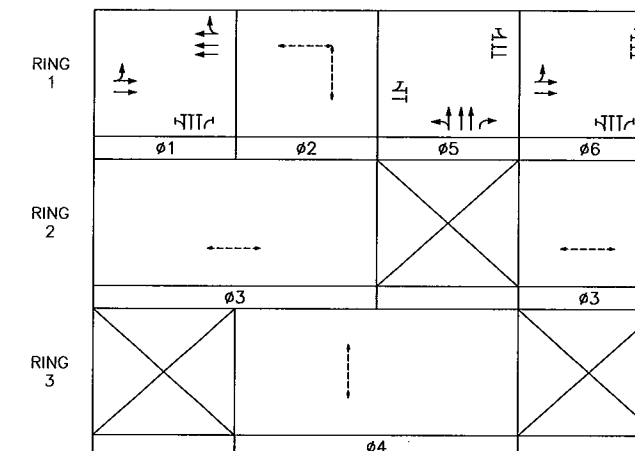
Howard/Stein-Hudson Assoc., Inc.  
 38 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Ph: 617.482.7080  
 Fax: 617.482.7417



<div></div> <div>(APPROX.)</div> <div>SUMMER STREET</div>		TIMING AND SEQUENCE CHART																		OPERATION FLASHING	
		<div></div> <div>ø1</div>			<div></div> <div>ø2</div>			<div></div> <div>ø3</div>			<div></div> <div>ø4</div>			<div></div> <div>ø5</div>			<div></div> <div>ø6</div>				
		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL		
STREET/DIRECTION/FACE		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL		
ATLANTIC/NB/5A,5B,5G		R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FY	
SUMMER/EB/2B		G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	FR	
SUMMER/EB/2A		G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	GL/G	YL/Y	R	FR	
SUMMER/WB/5C,5D		G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR	
C.W./E-W/2F,3E		DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
C.W./N-S/3F,5E		DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF	
C.W./E-W/2E,6F		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
C.W./N-S/5F,6E		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
INTERSECTIONS SECONDS VAL	MINIMUM GREEN	10			—			—			—			15			4				
	VEHICLE EXTENSION	2			—			—			—			2			—				
	MAXIMUM 1 GREEN	34			—			—			—			35			4				
	MAXIMUM 2 GREEN	23			—			—			—			37			4				
	YELLOW CLEARANCE		3											3			3				
	RED CLEARANCE			3		4		6		5		2				1					
	WALK INTERVAL				12			10*		8			7								
	PED. CLEARANCE					11		11**		11**			7								
MEMORY		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK				
RECALL (VEH./PED.)		MAX			OFF			PED			OFF			OFF			OFF				
PROGRAM/COORDINATION																					
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																		HOURS OF OPERATION
			ø1,ø3			ø2,ø3,ø4			ø4,ø5			ø3,ø6									
			27			27			28			8									
			23			27			42			8									
3		100	72	29			27			36			8								
COORDINATED OPERATION																					
---																					
---																					
PROGRAMMED FLASH																					
3:00 A.M. TO 6:00 A.M.																					
LOOP DETECTOR DATA									CLEARANCES							TECHNICAL NOTES					
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO							* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.				
									G	GL/G	R	—	—	W	DW						
									G	G	—	—	—	—	—						
									GL/G	YL/G	GL/G	YL/Y	—	—	—						
									R	—	—	R	—	—	—						
									—	—	—	—	—	—	—						
									—	—	—	—	—	—	—						
									W	—	—	—	—	W	FDW						
									DW	—	—	—	—	—	DW						

S/P = SERIES/PARALLEL

## PHASING DIAGRAM

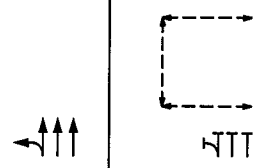


DESIGNED BY A. SIU  
DRAWN BY A. SIU  
CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
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CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING  
**SUMMER ST. & ATLANTIC AVE.**  
BOSTON PROPER  
INTERSECTION NUMBER 43  
SCALE: NOT TO SCALE  
DISTRICT: -  
AREA: 11  
DESIGN DATE: OCT. 2009

<div><div><div><div></div><div>(APPROX.)</div></div><div>ESSEX STREET</div></div><div>ATLANTIC AVENUE</div></div>			TIMING AND SEQUENCE CHART															OPERATION FLASHING			
			<div><div>↵</div><div>↑↑↑</div></div>			<div>↔</div>			<div>↓</div>			<div>↔</div>			<div>↑</div> <div>↑↑↑</div>						
STREET/DIRECTION/FACE			ø1			ø2			ø3			ø4			ø5						
ATLANTIC/NB/6A,6B			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL				FY
ESSEX/EB/2A,6C			R	R	R	R	R	R	R	R	R	R	R	R	GL	Y	R				FR
C.W./E-W/4E,5E			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW				OFF
C.W./E-W/2E,3E			DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF
C.W./N-S/3F,4F			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW				OFF
INTERVAL SECONDS	MINIMUM GREEN	10				-			-			-			10						
	VEHICLE EXTENSION	2				-			-			-			2						
	MAXIMUM 1 GREEN	50				-			-			-			27						
	MAXIMUM 2 GREEN	43				-			-			-			28						
	YELLOW CLEARANCE		3												3						
	RED CLEARANCE			2			4			5			5				2				
	WALK INTERVAL				7				7*			7									
	PED. CLEARANCE					9			7**				8**								
MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK						
RECALL (VEH./PED.)			MAX			OFF			PED			OFF			OFF						
PROGRAM/COORDINATION																					
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS															HOURS OF OPERATION			
			ø1,ø3			ø2,ø3,ø4			ø4,ø5												
1	90	23	39			20			31									ALL OTHER TIMES			
2	100	65	47			20			33									6:00 A.M. TO 10:00 A.M.			
3	100	24	48			20			32									2:30 P.M. TO 7:00 P.M.			
COORDINATED OPERATION																		EVERYDAY			
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PROGRAMMED FLASH																		3:00 A.M. TO 6:00 A.M.			
LOOP DETECTOR DATA									CLEARANCES								TECHNICAL NOTES				
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO							* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.				
									G	GL	R	-	-	W	DW						
									G	G	-	Y	-	-	-	-					
									GL	-	GL	Y	-	-	-	-					
									R	-	-	R	-	-	-	-					
									-	-	-	-	-	-	-	-					
									-	-	-	-	-	-	-	-					
									W	-	-	-	-	-	W	FDW					
									DW	-	-	-	-	-	-	DW					

BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS																	
OPERATION SCHEDULE																	
LOCATION: <u>Beach Street and Atlantic Avenue</u>										DESIGN DATE: <u>10/02/2009</u>							
INTERSECTION No.: <u>44</u>										DATE FIRST IN SERVICE: _____							
SECTION No.: <u>11</u>										PHASE 1							
CLEARANCE TABLE																FLASH OPERATION	
<div>FROM</div>		TO															
		G	R	-	-	W	DW										
		G	Y	-	-	-	-										
		R	-	-	-	-	-										
		-	-	-	-	-	-										
		-	-	-	-	-	-										
W	-	-	-	-	W	FDW											
DW	-	-	-	-	-	DW											
STREET		DIR	FACE		Ø1			Ø2*									
ATLANTIC AVE		NB	3A,3B		G	Y	R	R	R	R						FY	
CROSSWALK		ALL	2E,2F,3E,4E,5E,5F		DW	DW	DW	W	FDW	DW						OFF	
TIMING IN SECONDS																	
MINIMUM GREEN				20			-										
VEHICLE EXTENSION				2			-										
MAXIMUM #1 GREEN				80			-										
MAXIMUM #2 GREEN				71			-										
YELLOW CLEARANCE					3												
RED CLEARANCE						2			4								
WALK INTERVAL							10										
PEDESTRIAN CLEARANCE								10									
MEMORY				NON-LOCK			NON-LOCK										
RECALL (VEH/PED)				MAX			OFF										
*Ø2 PED RECALL FROM 7AM - 8PM. OTHERWISE, PUSH-BUTTON ACTUATED MAX. #2 DURING COORDINATED OPERATION																	
COORDINATION INFORMATION (TIMES IN SECONDS)																	
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2			HOURS OF OPERATION									
1	90		75	66	24			ALL OTHER TIMES									
2	100		55	76	24			6:30AM - 9:30AM									
3	100		15	76	24			3:30PM - 6:30PM									
FLASH OPERATION			-	-	-			3:00AM - 6:00AM									







## PHASE 1

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3		HOURS OF OPERATION
1	90	32	43	26	21		ALL OTHER TIMES
2	100	56	54	26	20		6:00AM - 10:00AM
3	100	49	41	26	33		2:30PM - 6:00PM
FLASH OPERATION		-	-	-	-		3:00AM - 6:00AM

DESIGN DATE: 10/2009  
DATE FIRST IN SERVICE: \_\_\_\_\_

CLEARANCE TABLE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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INTERSECTION No.: 374 SECTION No.: SB

## BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

DESIGN DATE: 10/2009

DATE FIRST IN SERVICE: \_\_\_\_\_

## OPERATION SCHEDULE - PHASE 1

CLEARANCE TABLE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

OPERATION SCHEDULE

LOCATION: Ramp D&B and D Street

DESIGN DATE: 10/2009

INTERSECTION No.: 4116

DATE FIRST IN SERVICE:

SECTION No.: SB

PHASE 1

CLEARANCE TABLE								<div><div><div><div>↙↓</div><div>↗↑↑</div></div></div><div><div><div>↙↑</div><div>↗TT</div></div></div><div><div><div>↙↑</div><div>↗↑↑</div></div></div></div>			FLASH OPERATION		
TO													
FROM	G	GV	GL	R	RL	W	DW						
G	G	-	-	Y	-	-	-						
GV	-	GV	-	Y	-	-	-						
GL	-	-	GL	-	YL	-	-						
R	-	-	-	R	-	-	-						
RL	-	-	-	-	RL	-	-						
W	-	-	-	-	-	W	FDW						
DW	-	-	-	-	-	-	DW						

STREET	DIR	FACE	Ø1			Ø2*			Ø3						
D STREET	NB	3C,3D	GV	Y	R	R	R	R	GV	Y	R				FY
D STREET	NB	3B,4B	RL	RL	RL	RL	RL	RL	GL	YL	RL				FRL
D STREET	SB	5A,6A	G	Y	R	R	R	R	R	R	R				FY
D STREET	SB	3A,4A	GV	Y	R	R	R	R	R	R	R				FY
CROSSWALK	ALL	-	DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF

TIMING IN SECONDS

MINIMUM GREEN	15			-			15						
VEHICLE EXTENSION	2			-			2						
MAXIMUM #1 GREEN	49			-			25						
MAXIMUM #2 GREEN	38			-			26						
YELLOW CLEARANCE		3						3					
RED CLEARANCE			2			4			2				
WALK INTERVAL				7									
PEDESTRIAN CLEARANCE					15								
MEMORY	NON-LOCK		LOCK		NON-LOCK								
RECALL (VEH/PED)	MAX		OFF		OFF								

\*Ø2 PUSH-BUTTON ACTUATED ONLY

MAX. #2 DURING COORDINATED OPERATION

COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3		HOURS OF OPERATION
1	90	38	37	26	27		ALL OTHER TIMES
2	100	12	43	26	31		6:00AM - 10:00AM
3	100	61	43	26	31		2:30PM - 6:00PM
FLASH OPERATION		-	-	-	-		3:00AM - 6:00AM

## OPERATION SCHEDULE

**LOCATION: MBTA Silverline Transitway and D Street**

DESIGN DATE: 10/2009INTERSECTION No.: 4060

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

## PHASE 1

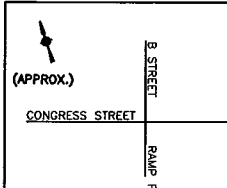
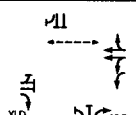
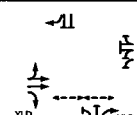
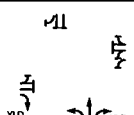
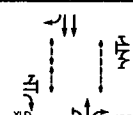
CLEARANCE TABLE																	FLASH OPERATION
		TO															
		G	GV	R	-	W	DW										
FROM	G	G															
	GV	-	GV	Y	-	-	-	-	-	-	-	-	-	-			
	R	-	-	R	-	-	-	-	-	-	-	-	-	-			
	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	W	-	-	-	-	-	W	FDW									
DW	-	-	-	-	-	-	DW										
STREET		DIR	FACE		Ø1			Ø2			Ø5						
D STREET		NB	5A,5B		GV	Y	R	R	R	R	R	R	R				FY
D STREET		NB	5C		G	Y	R	R	R	R	R	R	R				FY
D STREET		SB	2A,7C		GV	Y	R	GV	Y	R	R	R	R				FY
D STREET		SB	2B		G	Y	R	G	Y	R	R	R	R				FY
TRANSITWAY		EB	3A,4A,7A		R	R	R	R	R	R	G	Y	R				FR
TRANSITWAY		WB	4B,5D,7B		R	R	R	R	R	R	G	Y	R				FR
CROSSWALK		N/S	2F,5E,6E,8E		W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW				OFF
TIMING IN SECONDS																	
MINIMUM GREEN					20			5			8						
VEHICLE EXTENSION					3			3			3						
MAXIMUM #1 GREEN					38			19			25						
MAXIMUM #2 GREEN					41			21			26						
YELLOW CLEARANCE						3			3			3					
RED CLEARANCE							2			2			2				
WALK INTERVAL					14*												
PEDESTRIAN CLEARANCE					5**												
MEMORY					NON-LOCK			NON-LOCK			NON-LOCK						
RECALL (VEH/PED)					MAX			MAX			OFF						
*Ø1 PED SHALL REST IN WALK **PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS.																	
COORDINATION INFORMATION (TIMES IN SECONDS)																	
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2		Ø3				HOURS OF OPERATION						
1	90		18	39	23		28				ALL OTHER TIMES						
2	100		95	43	26		31				6:00AM - 10:00AM						
3	100		32	46	24		30				2:30PM - 6:00PM						
FLASH OPERATION			-	-	-		-				3:00AM - 6:00AM						

INTERSECTION No.: 4059 SECTION No.: SB

## BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS OPERATION SCHEDULE - PHASE 1

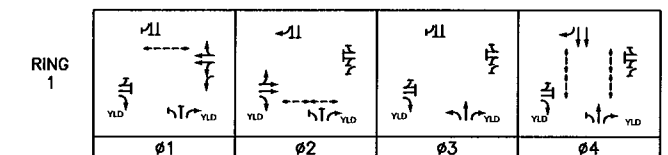
DESIGN DATE: 10/2009  
DATE FIRST IN SERVICE:

CLEARANCE TABLE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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TIMING AND SEQUENCE CHART														OPERATION FLASHING										
																								
		ø1			ø2			ø3			ø4													
		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL											
		STREET/DIRECTION/FACE		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN		CL	CL							FYL	
CONGRESS ST/WB/3D		GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL								FY			
CONGRESS ST/WB/3E		GL/G	Y	R	R	R	R	R	R	R	R	R	R								FY			
CONGRESS ST/WB/3F		G	Y	R	R	R	R	R	R	R	R	R	R								FY			
CONGRESS ST/EB/3C,4B		R	R	R	GL/G	YL/Y	R	R	R	R	R	R	R								FY			
CONGRESS ST/EB/3A,3B,6B		R	R	R	G	Y	R	R	R	R	R	R	R								FY			
RAMP F/NB/2A		RSL	RSL	RSL	RSL	RSL	RSL	GSL	YSL	RSL	RSL	RSL	RSL								FRSL			
RAMP F/NB/5A		RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL								FRL			
RAMP F/NB/3G,4A		R	R	R	R	R	R	R	R	R	G/GV	Y	R								FR			
B ST/SB/5B		R	R	R	R	R	R	R	R	R	GV	Y	R								FR			
B ST/SB/2B,6A		R	R	R	R/GR	R/YR	R	R	R	R	G/GR	Y/YR	R								FR			
CW/E-W/2F,4F		W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW								OFF			
CW/E-W/3Z,5E,5F,6E		DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW								OFF			
CW/N-S/2E,3Y,4E,6F,7E,7F		DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW								OFF			
INTERSECTIONS IN T E R S E C T I O N S	MINIMUM GREEN	17				8				8														
	VEHICLE EXTENSION	3				3				3														
	MAXIMUM 1 GREEN	21				20				11				21										
	MAXIMUM 2 GREEN	26				20				17				21										
	YELLOW CLEARANCE		3		3		3		3		3													
	RED CLEARANCE			3			3			3			3											
	WALK INTERVAL	7*			7						7													
	PED. CLEARANCE	11**			12**						12**													
MEMORY		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK													
RECALL (VEH./PED.)		MAX			MIN			OFF			OFF													
PROGRAM/COORDINATION																								
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																					
			ø1			ø2			ø3			ø4												
			24			25			14			27												
			24			26			23			27												
						32			26			15			27						HOURS OF OPERATION			
																					ALL OTHER TIMES			
																					6:00 A.M. TO 10:00 A.M.			
																					2:30 P.M. TO 7:00 P.M.			

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
DRAWN BY A. SIU  
CHECKED BY D. MATTON

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING

## CONGRESS ST. & B STREET/RAMP F

BOSTON PROPER  
INTERSECTION NUMBER 4058

SCALE: NOT TO SCALE  
DISTRICT: -  
AREA: SB  
DATE: OCT. 2009

HOWARD/STEIN-HUDSON ASSOCIATES, INC.  
38 Chauncy St., 9th Floor  
Boston, MA 02111  
Ph: 617.482.7080  
Fax: 617.482.7417

INTERSECTION No.: 4056 SECTION No.: SB

# BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS OPERATION SCHEDULE - PHASE 1

DESIGN DATE: 10/2009  
DATE FIRST IN SERVICE:

CLEARANCE TABLE																														FLASH OPERATION		
TO																																
G GV GV/GL GV/GR R W DW																																
FROM	G	G	-	-	-	Y	-	-																								
	GV	-	GV	-	-	Y	-	-																								
	GV/GL	-	-	GV/GL	-	Y	-	-																								
	GV/GR	-	-	-	GV/GR	Y	-	-																								
R	-	-	-	-	-	R	-	-																								
W	-	-	-	-	-	-	W	FDW																								
DW	-	-	-	-	-	-	-	DW																								
STREET			DIR	FACE		Ø1			Ø2			Ø3																				
CONGRESS ST			EB	6A		G	Y	R	R	R	R	R	R																FY			
CONGRESS ST			EB	6C,6H		GV	Y	R	R	R	R	R	R																FY			
CONGRESS ST			WB	10A,10B		G	Y	R	R	R	R	R	R																FY			
RAMP C			NB	10C		R	R	R	R	R	R	GV/GR	Y	R															FR			
RAMP C			NB	10D		R	R	R	R	R	R	GV	Y	R															FR			
RAMP I			NB	4A,4B,5A		R	R	R	G	Y	R	R	R	R															FR			
RAMP I			NB	6B		R	R	R	GV/GL	Y	R	R	R	R															FR			
RAMP I			NB	6D		R	R	R	GV	Y	R	R	R	R															FR			
CROSSWALK			E/W	2F,4E,6E,6F,8F,10E		W/FDW	DW	DW	DW	DW	DW	DW	DW	DW															OFF			
CROSSWALK			N/S	2E,3E,3F,6G		DW	DW	DW	W/FDW	DW	DW	DW	DW	DW															OFF			
CROSSWALK			N/S	8E,9E,9F,10F		DW	DW	DW	DW	DW	DW	W/FDW	DW	DW															OFF			
MINIMUM GREEN						10			8			8																	TIMING IN SECONDS			
VEHICLE EXTENSION						3			3			3																				
MAXIMUM #1 GREEN						25			24			30																				
MAXIMUM #2 GREEN						28			26			37																				
YELLOW CLEARANCE							3			3			3																			
RED CLEARANCE								3			3			3																		
WALK INTERVAL						7*			7			7																				
PEDESTRIAN CLEARANCE						12**			14**			15**																				
MEMORY						NON-LOCK			NON-LOCK			NON-LOCK																				
RECALL (VEH/PED)						MAX			OFF			OFF																				
COORDINATION INFORMATION (TIMES IN SECONDS)																																
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø3							HOURS OF OPERATION			TECHNICAL NOTES																
1	90		37	30	30	30							ALL OTHER TIMES			*Ø1 PED SHALL REST IN WALK																
2	100		73	29	28	43							6:00AM - 10:00AM			**PED INDICATION SHALL NOT DISPLAY FDW THROUGH																
3	100		27	34	32	34							2:30PM - 7:00PM			CONCURRENT VEHICLE CLEARANCE INTERVALS																
FLASH OPERATION				-	-	-	-	-	-	-	-	-	EMERGENCY/CONFLICT			-																







LOCATION: Seaport Boulevard & East Service Road  
INTERSECTION No.: 3107 SECTION No.: SB

## BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS OPERATION SCHEDULE - PHASE 1

DESIGN DATE: 10/2009  
DATE FIRST IN SERVICE: \_\_\_\_\_

CLEARANCE TABLE																										FLASH OPERATION	
TO																											
FROM		G	G/GL	RL	R	W	DW																				
		G	-	-	Y	-	-																				
		GL	-	-	YL	Y	-																				
		G/GL	-	G/GL	-	Y	-																				
		RL	-	-	RL	-	-																				
		R	-	-	-	R	-																				
W	-	-	-	-	W	FDW																					
DW	-	-	-	-	-	DW																					
STREET		DIR	FACE		Ø1		Ø2		Ø3		Ø4		Ø5														
SEAPORT BLVD		EB	9B,9C		G	Y	R	R	R	R	R	R	G	Y	R	G								FY			
SEAPORT BLVD		EB	9A		RL	RL	RL	RL	RL	RL	RL	RL	GL	YL	RL	RL								FRL			
SEAPORT BLVD		WB	3A,3B,8A		G	Y	R	R	R	R	R	R	R	R	R	R								FY			
EAST SERVICE		NB	5A		RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL								FRL			
EAST SERVICE		NB	6A,6B		R	R	R	R	R	R	G	Y	R	R	R	R								FR			
NORTHERN AVE		SB	5B,11A		RL	RL	RL	GL	YL	RL	RL	RL	RL	RL	RL	RL								FRL			
NORTHERN AVE		SB	11B,11C		R	R	R	G/GL	Y	R	R	R	R	R	R	R								FR			
CROSSWALK		E/W	4E,5E,5F 7E,10E,11F		W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W								OFF			
CROSSWALK		N/S	2E,2F,3E,11E		DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW								OFF			
CROSSWALK		N/S	7F,8E,8F,9E		DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW								OFF			
MINIMUM GREEN					10			8			8			5		4								TIMING IN SECONDS			
VEHICLE EXTENSION					3			3			3			2		-											
MAXIMUM #1 GREEN					21			21			22			5		4											
MAXIMUM #2 GREEN					24			22			22			5		4											
YELLOW CLEARANCE						3			3			3			3												
RED CLEARANCE							3			3			3			3											
WALK INTERVAL					3*			7			7					4											
PEDESTRIAN CLEARANCE					10**			13**			14**																
MEMORY					NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK		NON-LOCK												
RECALL (VEH/PED)					MAX		OFF		OFF		OFF		OFF		PED												
COORDINATION INFORMATION (TIMES IN SECONDS)																											
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø3	Ø4	Ø5				HOURS OF OPERATION			TECHNICAL NOTES												
1	90		0	22	26	27	11	4				ALL OTHER TIMES			*Ø1 PED SHALL REST IN WALK												
2	100		33	30	27	28	11	4				6:00AM - 10:00AM			**PED INDICATION SHALL NOT DISPLAY FDW THROUGH												
3	100		28	29	28	28	11	4				2:30PM - 7:00PM			CONCURRENT VEHICLE CLEARANCE INTERVALS												
FLASH OPERATION			-	-	-	-	-	-				EMERGENCY/CONFLICT			-												







## OPERATION SCHEDULE

LOCATION: Summer Street and West Side Drive

DESIGN DATE: 10/2009INTERSECTION No.: 4111

DATE FIRST IN SERVICE:

SECTION No.: SB

## PHASE 1

CLEARANCE TABLE																		FLASH OPERATION	
TO																			
	G	GL	GL/G	GL/GR	R/GR	R	W	DW											
FROM	G	G	-	-	-	-	Y	-	-										
	GL	-	GL	-	-	-	YL	-	-										
	GL/G	YL/G	-	GL/G	-	-	YL/Y	-	-										
	GL/GR	-	-	-	GL/GR	-	YL/YR	-	-										
	R/GR	-	-	-	-	R/GR	R/YR	-	-										
	R	-	-	-	-	-	R	-	-										
	-	-	-	-	-	-	-	-	-										
	W	-	-	-	-	-	-	W	FDW										
DW	-	-	-	-	-	-	-	DW											
STREET			DIR	FACE			Ø1			Ø2*			Ø3			Ø4			
SUMMER ST			EB	4A,4B			G	Y	R	R	R	R	R	R	R	R	R	FY	
SUMMER ST			WB	6B,6C			G	Y	R	R	R	R	R	R	G	Y	R	FY	
SUMMER ST			WB	6A			G	Y	R	R	R	R	R	R	GL/G	YL/Y	R	FY	
WEST SIDE DR			NB	2A			R	R	R	R	R	R	GL	YL	R	R	R	FR	
WEST SIDE DR			NB	3A			R	R	R	R	R	R	GL/GR	YL/YR	R	R/GR	R/YR	R	FR
CROSSWALK			ALL	3F,4E,4F,5E,5F,6F			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	OFF	
TIMING IN SECONDS																			
MINIMUM GREEN							10			-			8			8			
VEHICLE EXTENSION							2			-			2			2			
MAXIMUM #1 GREEN							45			-			13			9			
MAXIMUM #2 GREEN							37			-			14			10			
YELLOW CLEARANCE								3						3			3		
RED CLEARANCE									2			4			2			2	
WALK INTERVAL										7									
PEDESTRIAN CLEARANCE											17								
MEMORY							NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			
RECALL (VEH/PED)							MAX			OFF			OFF			OFF			
*Ø2 PUSH-BUTTON ACTUATED ONLY MAX. #2 DURING COORDINATED OPERATION																			
COORDINATION INFORMATION (TIMES IN SECONDS)																			
CYCLE	CYCLE LENGTH			OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION										
1	90			86	28	28	19	15	ALL OTHER TIMES										
2	100			7	38	28	19	15	6:00AM - 10:00AM										
3	100			89	42	28	17	13	2:30PM - 7:00PM										
FLASH OPERATION				-	-	-	-	-	EMERGENCY/CONFLICT										

## OPERATION SCHEDULE

**LOCATION:** Summer Street and World Trade Center Avenue

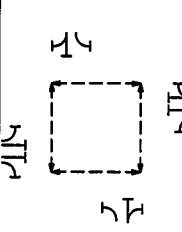
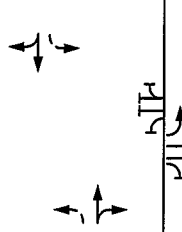
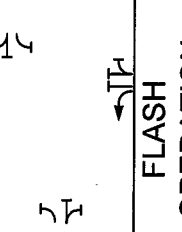
DESIGN DATE: 10/2009

INTERSECTION No.: 664

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

## PHASE 1

CLEARANCE TABLE																				FLASH OPERATION	
FROM		TO																			
		G	GL/R	R	-	W	DW														
		G	-	GL/R	YL/R	-	-														-
		GL/R	-	GL/R	YL/R	-	-														-
		R	-	-	R	-	-														-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
W	-	-	-	-	-	W	FDW	-	-	-	-	-	-	-	-						
DW	-	-	-	-	-	-	DW	-	-	-	-	-	-	-	-						
STREET		DIR	FACE		Ø1			Ø2*			Ø3			Ø4							
SUMMER ST		EB	4B,4C,6B		G	Y	R	R	R	R	R	R	R	R	R	FY					
SUMMER ST		EB	4A		G	Y	R	R	R	R	R	R	R	GL/R	YL/R	R	FY				
SUMMER ST		WB	2B,8A,8B		G	Y	R	R	R	R	R	R	R	R	R	R	FY				
SUMMER ST		WB	7A		G	Y	R	R	R	R	R	R	R	GL/R	YL/R	R	FY				
WORLD TRADE		NB	3A,9A		R	R	R	R	R	R	G	Y	R	R	R	R	FR				
WORLD TRADE		SB	5A,6A		R	R	R	R	R	R	G	Y	R	R	R	R	FR				
CROSSWALK		ALL	2F,3E,5E,5F 6E,6F,9E,9F		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF				
TIMING IN SECONDS																					
MINIMUM GREEN					10			-			8			8							
VEHICLE EXTENSION					2			-			2			2							
MAXIMUM #1 GREEN					49			-			14			13							
MAXIMUM #2 GREEN					39			-			17			17							
YELLOW CLEARANCE						3						3			3						
RED CLEARANCE							2			4			2			1					
WALK INTERVAL								7													
PEDESTRIAN CLEARANCE									15												
MEMORY					NON-LOCK			LOCK			NON-LOCK			NON-LOCK							
RECALL (VEH/PED)					MAX			OFF			OFF			OFF							
*Ø2 PUSH-BUTTON ACTUATED ONLY MAX. #2 DURING COORDINATED OPERATION																					
COORDINATION INFORMATION (TIMES IN SECONDS)																					
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION													
1	90		0	24	26	19	21	ALL OTHER TIMES													
2	100		6	42	26	16	16	6:00AM - 10:00AM													
3	100		0	37	26	22	15	2:30PM - 6:00PM													
FLASH OPERATION			-	-	-	-	-	3:00AM - 6:00AM													

## OPERATION SCHEDULE

**LOCATION:** Seaport Boulevard and Boston Wharf Road

DESIGN DATE: 10/2009

INTERSECTION No.: 3108

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: SB

## PHASE 1

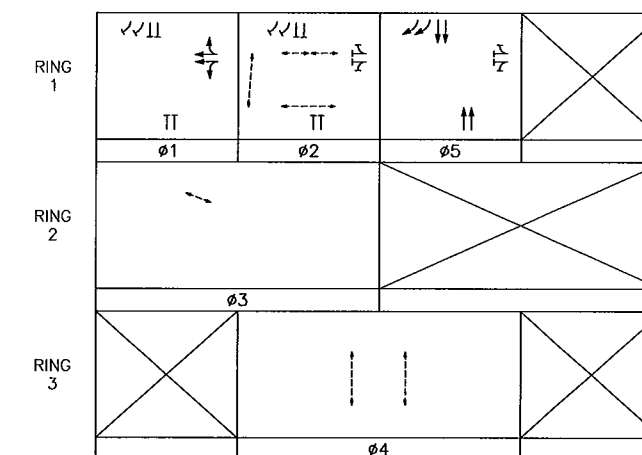
CLEARANCE TABLE																				FLASH OPERATION	
FROM		TO																			
		G	GL	GL/G	GL/GR	RL	R	W	DW												
		G	G	-	-	-	-	-	-												
GL	-	GL	-	-	YL	-	-	-	-	-	-	-	-	-	-						
GL/G	YL/G	GL	GL/G	-	YL/Y	-	-	-	-	-	-	-	-	-	-						
GL/GR	-	-	-	GL/GR	-	-	-	-	-	-	-	-	-	-	-						
R	-	-	-	-	-	R	-	-	-	-	-	-	-	-	-						
W	-	-	-	-	-	-	-	W	FDW	-	-	-	-	-	-						
DW	-	-	-	-	-	-	-	-	DW	-	-	-	-	-	-						
STREET			DIR	FACE			Ø1			Ø2*			Ø3			Ø4					
SEAPORT BLVD			EB	7A,7B			G	Y	R	R	R	R	R	R	R	R	R	FY			
SEAPORT BLVD			WB	4A,4B			G	Y	R	R	R	R	R	R	G	Y	R	FY			
SEAPORT BLVD			WB	4C			G	Y	R	R	R	R	R	R	GL/G	YL/Y	R	FY			
BOSTON WHARF			NB	5A			RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	FRL			
BOSTON WHARF			NB	5B			R	R	R	R	R	R	GL/GR	Y	R	R	R	FR			
CROSSWALK			-	ALL			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	OFF			
TIMING IN SECONDS																					
MINIMUM GREEN						10			-			8			8						
VEHICLE EXTENSION						3			-			3			3						
MAXIMUM #1 GREEN						48			-			11			9						
MAXIMUM #2 GREEN						43			-			16			12						
YELLOW CLEARANCE							3						3			3					
RED CLEARANCE								3			4			2			2				
WALK INTERVAL									7												
PEDESTRIAN CLEARANCE										14											
MEMORY						NON-LOCK			LOCK			NON-LOCK			NON-LOCK						
RECALL (VEH/PED)						MAX			OFF			OFF			OFF						
*Ø2 PUSH-BUTTON ACTUATED ONLY MAX. #2 DURING COORDINATED OPERATION																					
COORDINATION INFORMATION (TIMES IN SECONDS)																					
CYCLE	CYCLE LENGTH			OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION												
1	90			82	39	25	13	13	ALL OTHER TIMES												
2	100			2	49	25	13	13	6:00AM - 10:00AM												
3	100			29	37	25	21	17	2:30PM - 7:00PM												
FLASH OPERATION				-	-	-	-	-	EMERGENCY/CONFLICT												



TIMING AND SEQUENCE CHART																						
<div><div><div><div></div><div>(APPROX.)</div></div><div><div>CONGRESS STREET</div><div>STATE STREET</div></div></div></div>																		OPERATION FLASHING				
			ø1			ø2			ø3			ø4			ø5							
STREET/DIRECTION/FACE			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL					
STATE ST/WB/4A,4B,9B			G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R			FR		
CONGRESS ST/NB/5A,6A			R	R	R	R	R	R	R	R	R	R	R	R	GV	Y	R			FY		
CONGRESS ST/SB/8A,9A			R	R	R	R	R	R	R	R	R	R	R	R	GV	Y	R			FY		
CONGRESS ST/SB/10A,11A			R	R	R	R	R	R	R	R	R	R	R	R	GV/GR	Y	R			FY		
C.W./E-W/2F,3E			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW			OFF		
C.W./N-W/4E,6F,7F,9E			DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW			OFF		
C.W./E-W/2E,4F,5E,5F,6E,7E,8E,11E			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW			OFF		
INTERVALS	MINIMUM GREEN	10				-				-				10								
	VEHICLE EXTENSION	2				-				-				2								
	MAXIMUM 1 GREEN	39				-				-				35								
	MAXIMUM 2 GREEN	29				-				-				39								
	YELLOW CLEARANCE		3												3							
	RED CLEARANCE			4													2					
	WALK INTERVAL				7				10*				10									
	PED. CLEARANCE					11				5**				11**								
MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK							
RECALL (VEH./PED.)			MAX			PED			PED			PED			MAX							
PROGRAM/COORDINATION																						
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																			
			ø1,ø3			ø2,ø3,ø4			ø4,ø5													
1	90	63	34			22			34									HOURS OF OPERATION				
2	100	91	36			22			42									ALL OTHER TIMES				
3	100	4	34			22			44									6:00 A.M. TO 10:00 A.M.				
																		2:30 P.M. TO 7:00 P.M.				
COORDINATED OPERATION																		EVERYDAY				
----																		-----				
----																		-----				
PROGRAMMED FLASH																		EMERGENCY/CONFLICT				
LOOP DETECTOR DATA									CLEARANCES								TECHNICAL NOTES					
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO							* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.					
									G	G	GV	GV/GR	R	-	W	DW						
									G	G	-	-	Y	-	-	-						
									GV	-	GV	-	Y	-	-	-						
									GV/GR	-	-	GV/GR	Y	-	-	-						
									R	-	-	-	R	-	-	-						
									-	-	-	-	-	-	-	-						
									W	-	-	-	-	-	W	FDW						
									DW	-	-	-	-	-	-	DW						

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
 DRAWN BY A. SIU  
 CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
 38 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Ph: 617.462.7080  
 Fax: 617.462.7417

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING

## STATE ST. & CONGRESS ST.

BOSTON PROPER  
 INTERSECTION NUMBER 52

SCALE: NOT TO SCALE  
 DISTRICT: -

AREA: GC  
 DESIGN DATE: OCT. 2009

DESIGN DATE: 10/2009  
DATE FIRST IN SERVICE: \_\_\_\_\_

BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

OPERATION SCHEDULE

LOCATION: North Street and Union Street

DESIGN DATE: 10/2009

INTERSECTION No.: 1909

DATE FIRST IN SERVICE:

SECTION No.: GC

PHASE 1

CLEARANCE TABLE																	FLASH OPERATION											
		TO																										
		G	GL/G	R	-	W	DW																					
FROM	G	G	-	Y	-	-	-													-								
	GL/G	YL/G	GL/G	YL/Y	-	-	-													-								
	R	-	-	R	-	-	-													-								
	-	-	-	-	-	-	-													-								
	W	-	-	-	-	W	FDW																					
DW	-	-	-	-	-	-	DW																					
STREET		DIR	FACE		Ø1			Ø5			Ø6																	
NORTH STREET		EB	2A,2B		G	Y	R	G	Y	R	R	R	R				FY											
NORTH STREET		EB	5A		G	Y	R	GL/G	YL/Y	R	R	R	R				FY											
NORTH STREET		WB	2C,3A,4A		G	Y	R	R	R	R	R	R	R				FY											
CROSSWALK		N/S	2E,5E		DW	DW	DW	DW	DW	DW	W	FDW	DW				OFF											
TIMING IN SECONDS																												
MINIMUM GREEN					25			10			-																	
VEHICLE EXTENSION					2			-			-																	
MAXIMUM #1 GREEN					52			26			-																	
MAXIMUM #2 GREEN					44			27			-																	
YELLOW CLEARANCE						3			3																			
RED CLEARANCE							1			1			4															
WALK INTERVAL											8																	
PEDESTRIAN CLEARANCE												10																
MEMORY					NON-LOCK			NON-LOCK			NON-LOCK																	
RECALL (VEH/PED)					MAX			MAX			OFF																	
MAX. #2 DURING COORDINATED OPERATION																												
COORDINATION INFORMATION (TIMES IN SECONDS)																												
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø5	Ø6	HOURS OF OPERATION																					
1	90		70	40	28	22	ALL OTHER TIMES																					
2	100		7	47	31	22	6:00AM - 10:00AM																					
3	100		22	48	30	22	2:30PM - 7:00PM																					
FLASH OPERATION			-	-	-	-	3:00AM - 6:00AM																					

## OPERATION SCHEDULE

**LOCATION:** Hanover Street and Congress Street

DESIGN DATE: 10/2009INTERSECTION No.: 4035

DATE FIRST IN SERVICE: \_\_\_\_\_

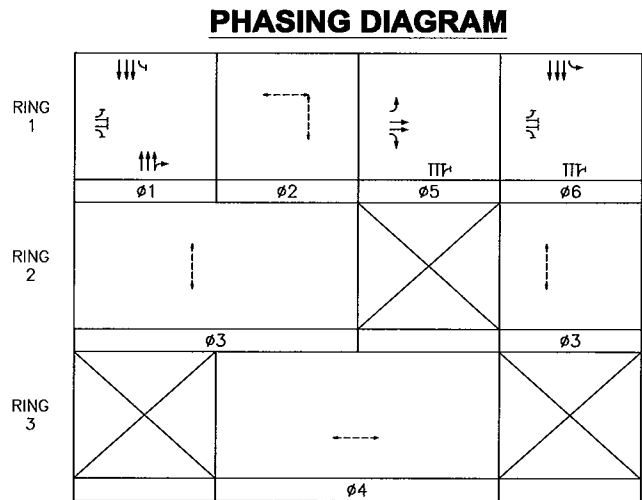
SECTION No.: GC

## PHASE 1

CLEARANCE TABLE																		FLASH OPERATION				
FROM		TO																				
		G	GR	GV	R	W	DW															
		G	-	-	Y	-	-															
		GR	-	GR	-	Y	-															-
		GV	-	-	GV	Y	-															-
R	-	-	-	R	-	-																
W	-	-	-	-	W	FDW																
DW	-	-	-	-	-	DW																
STREET		DIR	FACE		Ø1			Ø2														
HANOVER ST		WB	3A,6A		R	R	R	GR	Y	R							FR					
CONGRESS ST		NB	7A,7B		GV	Y	R	R	R	R							FY					
CONGRESS ST		NB	7C		G	Y	R	R	R	R							FY					
CONGRESS ST		SB	3B,4A,4B		GV	Y	R	R	R	R							FY					
CROSSWALK		N/S	2E,8E		W/ FDW	DW	DW	DW	DW	DW							OFF					
CROSSWALK		E/W	2F,3E,3F,5E		DW	DW	DW	W/ FDW	DW	DW							OFF					
TIMING IN SECONDS																						
MINIMUM GREEN					10			8														
VEHICLE EXTENSION					2			2														
MAXIMUM #1 GREEN					56			25														
MAXIMUM #2 GREEN					61			35														
YELLOW CLEARANCE						3			3													
RED CLEARANCE							2			1												
WALK INTERVAL					7*			8														
PEDESTRIAN CLEARANCE					6**			15**														
MEMORY					NON-LOCK			NON-LOCK														
RECALL (VEH/PED)					MAX			OFF														
*Ø1 PED SHALL REST IN WALK ** PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS																						
COORDINATION INFORMATION (TIMES IN SECONDS)																						
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2					HOURS OF OPERATION												
1	90		13	57	33					ALL OTHER TIMES												
2	100		38	61	39					6:00AM - 10:00AM												
3	100		40	66	34					2:30PM - 7:00PM												
FLASH OPERATION			-	-	-					3:00AM - 6:00AM												

<div><div><div><div></div></div><div>(APPROX.)</div></div><div>NEW SUDBURY</div><div><div>ALTERNATE STREET</div><div>CONGRESS STREET</div></div></div>		TIMING AND SEQUENCE CHART																		OPERATION FLASHING	
		<div><div><div></div></div><div></div></div>			<div><div><div></div></div><div></div></div>			<div><div><div></div></div><div></div></div>			<div><div><div></div></div><div></div></div>			<div><div><div></div></div><div></div></div>			<div><div><div></div></div><div></div></div>				
		ø1			ø2			ø3			ø4			ø5			ø6				
STREET/DIRECTION/FACE		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL		
CONGRESS ST/NB/2A,2B		GV	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY	
CONGRESS ST/NB/2C		G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY	
CONGRESS ST/SB/6A,6B		GV	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	GV	Y	R	FY	
CONGRESS ST/SB/5A		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	GL	Y	R	FY	
NEW SUDBURY/EB/3A,3B,3C		R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR	
C.W./-/6F,7E		DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
C.W./-/3E,4F,7F,8E,9E,10E		DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF	
C.W./-/4E,6E		DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF	
INTERVALS	MINIMUM GREEN	10			-			-			-			11			7				
	VEHICLE EXTENSION	2			-			-			-			2			2				
	MAXIMUM 1 GREEN	40			-			-			-			20			10				
	MAXIMUM 2 GREEN	31			-			-			-			22			10				
	YELLOW CLEARANCE		3												3			3			
	RED CLEARANCE			3			4			6			6			3				1	
	WALK INTERVAL				7			7*			7										
	PED. CLEARANCE					15			12**			12**									
MEMORY		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK				
RECALL (VEH./PED.)		MAX.			OFF			PED			OFF			OFF			OFF				
PROGRAM/COORDINATION																					
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																		HOURS OF OPERATION
			ø1,ø3			ø2,ø3,ø4			ø4,ø5			ø3,ø6									
1	90	31	26			26			25			13									ALL OTHER TIMES
2	100	57	35			26			25			14									6:00 A.M. TO 10:00 A.M.
3	100	49	34			26			28			12									2:30 P.M. TO 7:00 P.M.
COORDINATED OPERATION																					EVERYDAY
----																					-----
----																					-----
PROGRAMMED FLASH																					EMERGENCY/CONFLICT
LOOP DETECTOR DATA										CLEARANCES								TECHNICAL NOTES			
IDENT.	QTY.	SIZE	SPICE	TURNS	MODE	øCALL	øEXT.	CHNL.		FROM	TO							* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1 ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.			
										G	G	GV	GL	R	-	W	DW				
										G	G	-	-	Y	-	-	-				
										GV	-	GV	-	Y	-	-	-				
										GL	-	-	GL	Y	-	-	-				
										R	-	-	-	R	-	-	-				
										-	-	-	-	-	-	-	-				
										W	-	-	-	-	-	W	FDW				
										DW	-	-	-	-	-	-	DW				

S/P = SERIES/PARALLEL



DESIGNED BY A. SIU  
 DRAWN BY A. SIU  
 CHECKED BY D. MATTON

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING  
**NEW SUDBURY ST. & CONGRESS ST.**  
 BOSTON PROPER  
 INTERSECTION NUMBER 1685  
 SCALE: NOT TO SCALE  
 DISTRICT: -  
 AREA: GC  
 DESIGN DATE: OCT. 2009

Howard/Stein-Hudson Assoc., Inc.  
 38 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Ph: 617.462.7080  
 Fax: 617.462.7417



## OPERATION SCHEDULE

LOCATION: South Station Connector (SSCONN) and Albany Street

DESIGN DATE: 10/2009INTERSECTION No.: 4110

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

## PHASE 1

CLEARANCE TABLE																	FLASH OPERATION			
FROM		TO																		
		G	GL	R	-	W	DW													
		G	-	GL	Y	-	-													-
		GL	-	GL	Y	-	-													-
		R	-	-	R	-	-													-
-	-	-	-	-	-	-														
W	-	-	-	-	W	FDW														
DW	-	-	-	-	-	DW														
STREET		DIR	FACE		Ø1			Ø2*			Ø3									
ALBANY STREET		SB	4A,4B		G	Y	R	R	R	R	R	R	R				FY			
SSCONN		WB	4C,5A		R	R	R	R	R	R	GL	Y	R				FR			
CROSSWALK		N/S	2E,3E		DW	DW	DW	W	FDW	DW	DW	DW	DW				OFF			
TIMING IN SECONDS																				
MINIMUM GREEN					10			-			8									
VEHICLE EXTENSION					2			-			2									
MAXIMUM #1 GREEN					57			-			18									
MAXIMUM #2 GREEN					50			-			19									
YELLOW CLEARANCE						3						3								
RED CLEARANCE							2			4			2							
WALK INTERVAL								10												
PEDESTRIAN CLEARANCE									10											
MEMORY					NON-LOCK			LOCK			NON-LOCK									
RECALL (VEH/PED)					MAX			OFF			OFF									
*Ø2 PUSH-BUTTON ACTUATED ONLY																				
COORDINATION INFORMATION (TIMES IN SECONDS)																				
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2		Ø3					HOURS OF OPERATION								
1	90		50	42	24		24					ALL OTHER TIMES								
2	100		71	55	24		21					6:00AM - 10:00AM								
3	100		0	53	24		23					2:30PM - 7:00PM								
FLASH OPERATION			-	-	-		-					3:00AM - 6:00AM								







## OPERATION SCHEDULE

LOCATION: South Station Connector (SSCONN) and Ramps K&X

DESIGN DATE: 10/2009INTERSECTION No.: 4109

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 11

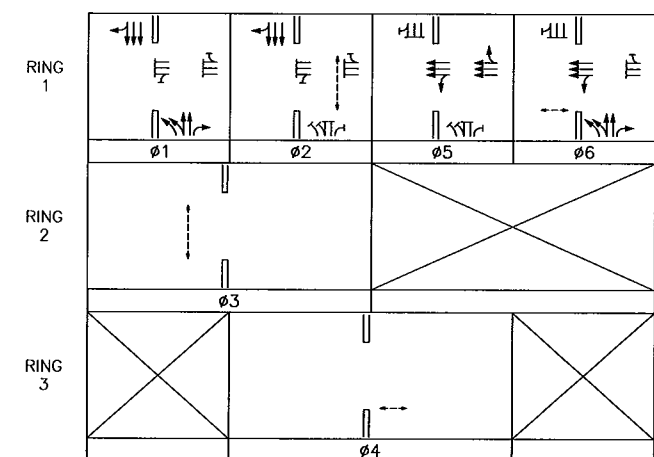
## PHASE 1

CLEARANCE TABLE																				FLASH OPERATION										
		TO																												
		G	GR	R	-	W	DW																							
FROM	G	G	-	R	-	-	-																-							
	GR	-	GR	YR	-	-	-																							
	R	-	-	R	-	-	-																							
	-	-	-	-	-	-	-																							
W	-	-	-	-	W	FDW																								
DW	-	-	-	-	-	-	DW																							
STREET		DIR	FACE		Ø1			Ø2			Ø5																			
RAMP K		NB	2J,2K		G	Y	R	R	R	R	R	R	R				FY													
LINCOLN ST		SB	2F,2G,2H		G	Y	R	R	R	R	R	R	R				FY													
SSCONN		EB	2A,2B		R	R	R	R	R	R	G	Y	R				FR													
SSCONN		EB	3A		R	R	R	GR	YR	R	G	Y	R				FR													
SSCONN		WB	2C,2D,4A		R	R	R	R	R	R	G	Y	R				FR													
CROSSWALK		-	2E,6E		DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW				OFF													
TIMING IN SECONDS																														
MINIMUM GREEN					10			8			8																			
VEHICLE EXTENSION					2			2			2																			
MAXIMUM #1 GREEN					39			23			19																			
MAXIMUM #2 GREEN					49			27			26																			
YELLOW CLEARANCE						3			3			3																		
RED CLEARANCE							2			2			2																	
WALK INTERVAL								7																						
PEDESTRIAN CLEARANCE								8**																						
MEMORY					NON-LOCK			NON-LOCK			NON-LOCK																			
RECALL (VEH/PED)					MAX			OFF			OFF																			
**PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS																														
COORDINATION INFORMATION (TIMES IN SECONDS)																														
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2		Ø5				HOURS OF OPERATION																			
1	90		69	42	26		22				ALL OTHER TIMES																			
2	100		59	54	26		20				6:00AM - 10:00AM																			
3	100		15	37	32		31				2:30PM - 7:00PM																			
FLASH OPERATION			-	-	-		-				EMERGENCY/CONFLICT																			

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S/P = SERIES/PARALLEL

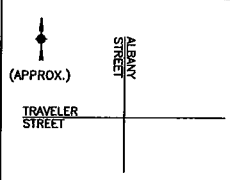
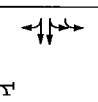



## PHASING DIAGRAM



DESIGNED BY A. SIU  
 DRAWN BY A. SIU  
 CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
 38 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Ph: 617.482.7080  
 Fax: 617.482.7417

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING  
**E. BERKELEY / FRNB / ALBANY / 4TH ST.**  
**PHASE 1**  
 BOSTON PROPER  
 INTERSECTION NUMBER 312  
 SCALE: NOT TO SCALE  
 DISTRICT: -  
 AREA: 19  
 DESIGN DATE: OCT. 2009

TIMING AND SEQUENCE CHART																																	
															OPERATION FLASHING																		
			ø1			ø2			ø3			ø5																					
STREET/DIRECTION/FACE			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL																			
ALBANY/SB/4A,4B,5A			G	Y	R	R	R	R	R	R	R	R	R	R					FY														
ALBANY/SB/3C			GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL					FYL														
TRAVELER/EB/3A,3B			R	R	R	R	R	R	R	R	R	G	Y	R					FR														
C.W./N-S/4F,5E			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW					OFF														
C.W./E-W/2E,4E			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW					OFF														
C.W./N-S/3E,6E			DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW					OFF														
INTERSECTIONS	MINIMUM GREEN	10				-			-			8																					
	VEHICLE EXTENSION	2				-			-			2																					
	MAXIMUM 1 GREEN	66				-			-			28																					
	MAXIMUM 2 GREEN	59				-			-			30																					
	YELLOW CLEARANCE		4							4																							
	RED CLEARANCE			2				4			6			2																			
	WALK INTERVAL						7				7*																						
	PED. CLEARANCE						8				5**																						
MEMORY		NON-LOCK					NON-LOCK					NON-LOCK					NON-LOCK																
RECALL (VEH./PED.)		MAX					OFF					PED					OFF																
PROGRAM/COORDINATION																																	
PHASE SPLITS IN SECONDS																																	
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	ø1,ø3					ø2,ø3					ø5																				
1	100	39	49					19					32																				
2	120	116	65					19					36																				
3	110	80	56					19					35																				
COORDINATED OPERATION																																	
----																																	
----																																	
PROGRAMMED FLASH																																	
LOOP DETECTOR DATA																		CLEARANCES								TECHNICAL NOTES							
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO							*ø3 PED SHALL REST IN WALK DURING CO-ORD ø1. ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.																
									G	GL	R	RL	-	W	DW																		
									G	-	Y	-	-	-	-																		
									GL	-	GL	-	YL	-	-																		
									R	-	-	R	-	-	-																		
									RL	-	-	-	RL	-	-																		
									-	-	-	-	-	-	-																		
									W	-	-	-	-	W	FDW																		
									DW	-	-	-	-	-	DW																		

BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

OPERATION SCHEDULE

LOCATION: Herald Street and Albany Street

DESIGN DATE: 10/2009

INTERSECTION No.: 70

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 9

PHASE 1

CLEARANCE TABLE							
		TO					
		G	GR	R	-	W	DW
FROM	G	G	-	Y	-	-	-
	GR	-	GR	Y	-	-	-
	R	-	-	R	-	-	-
	-	-	-	-	-	-	-
	W	-	-	-	-	W	FDW
DW	-	-	-	-	-	-	DW

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FLASH OPERATION

STREET	DIR	FACE	Ø1			Ø2									
HERALD ST	EB	1A,2A	GR	Y	R	R	R	R							FY
ALBANY ST	SB	3A,3B	R	R	R	G	Y	R							FR
CROSSWALK	E/W	6E,7E	W/FDW	DW	DW	DW	DW	DW							OFF
CROSSWALK	N/S	4E,5E	DW	DW	DW	W/FDW	DW	DW							OFF

TIMING IN SECONDS

MINIMUM GREEN	8			8										
VEHICLE EXTENSION	2			2										
MAXIMUM #1 GREEN	37			43										
MAXIMUM #2 GREEN	45			45										
YELLOW CLEARANCE		4			4									
RED CLEARANCE			1			1								
WALK INTERVAL	7*			7										
PEDESTRIAN CLEARANCE	5**			5**										
MEMORY		NON-LOCK		NON-LOCK										
RECALL (VEH/PED)		MAX		OFF										

\*Ø1 PED SHALL REST IN WALK

\*\*PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS

COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2			HOURS OF OPERATION
1	90	25	45	45			ALL OTHER TIMES
2	80	25	32	48			6:00AM - 10:00AM
3	100	0	50	50			2:30PM - 7:00PM
FLASH OPERATION		-	-	-			EMERGENCY/CONFLICT

BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

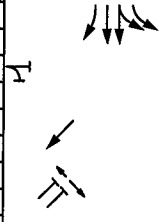
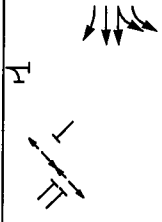
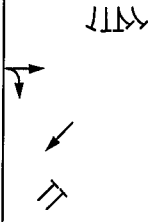
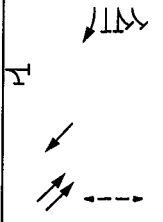
OPERATION SCHEDULE

LOCATION: MBTA Driveway (near Randolph) and Albany Street      DESIGN DATE: 10/2009

INTERSECTION No.: 1333      DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 19      PHASE 1

CLEARANCE TABLE

FROM		TO												FLASH OPERATION
		G	GV/GL	GV/GR	GR	R	W	DW						
G	G	-	-	-	Y	-	-							
GV/GL	-	GV/GL	-	-	Y	-	-							
GV/GR	-	-	GV/GR	-	Y	-	-							
GR	-	-	-	GR	Y	-	-							
R	-	-	-	-	R	-	-							
W	-	-	-	-	-	W	FDW							
DW	-	-	-	-	-	-	DW							

STREET	DIR	FACE	Ø1			Ø2			Ø3			Ø4			
ALBANY ST	SB	8B,8C	G	Y	R	G	Y	R	R	R	R	R	R	R	FY
ALBANY ST	SB	7A,8A	GV/GL	Y	R	GV/GL	Y	R	R	R	R	R	R	R	FY
ALBANY ST	SB	9B,10A,10B	G	Y	R	G	Y	R	R	R	R	G	Y	R	FY
ALBANY ST	SB	2A,2B	G	Y	R	R	R	R	G	Y	R	G	Y	R	FY
ALBANY ST	NB	8D,8G,8H	R	R	R	R	R	R	R	R	R	GR	Y	R	FY
MBTA DRIVEWAY	EB	8J,8K,9A	R	R	R	R	R	R	GV/GR	Y	R	R	R	R	FR
CROSSWALK	-	3F,4E	W/ FDW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	2E,3E	DW	DW	DW	W/ FDW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
CROSSWALK	-	5E,6E	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/ FDW	DW	DW	OFF

TIMING IN SECONDS

MINIMUM GREEN	10			10			10			10		
VEHICLE EXTENSION	2			2			2			2		
MAXIMUM #1 GREEN	16			16			12			41		
MAXIMUM #2 GREEN	19			17			13			46		
YELLOW CLEARANCE		4			4			4			4	
RED CLEARANCE			2			2			3			2
WALK INTERVAL	7*			7						7		
PEDESTRIAN CLEARANCE	5**			5**						5**		
MEMORY	NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK		
RECALL (VEH/PED)	MAX			OFF			OFF			ON		

\*Ø1 PED SHALL REST IN WALK  
\*\*PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS

COORDINATION INFORMATION (TIMES IN SECONDS)

CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2	Ø3	Ø4	HOURS OF OPERATION
1	100	24	21	21	19	39	ALL OTHER TIMES
2	120	35	25	23	20	52	6:00AM - 10:00AM
3	110	97	21	21	19	49	2:30PM - 7:00PM
FLASH OPERATION		-	-	-	-	-	EMERGENCY/CONFLICT

BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

OPERATION SCHEDULE

LOCATION: I-93 Ramp A2&I and Frontage Road Southbound

DESIGN DATE: 10/2009

INTERSECTION No.: 9993

DATE FIRST IN SERVICE:

SECTION No.: 7

PHASE 1

CLEARANCE TABLE								<div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div></div> <th colspan="2" rowspan="6"></th> <th colspan="2" rowspan="6"></th> <th colspan="2" rowspan="6"></th> <th colspan="2" rowspan="6">FLASH OPERATION</th>								FLASH OPERATION	
TO																	
		G	R	-	-	W	DW										
FROM	G	G	Y	-	-	-	-										
	R	-	R	-	-	-	-										
	-	-	-	-	-	-	-										
	-	-	-	-	-	-	-										
	W	-	-	-	-	W	FDW										
DW	-	-	-	-	-	-	DW										

STREET		DIR	FACE		Ø1			Ø2									
FRONTAGE RD		SB	4A,4B		G	Y	R	R	R	R							FY
I-93 OFF-RAMP		WB	5A,5B		R	R	R	G	Y	R							FR
CROSSWALK		N/S	2E,3E		W/ FDW	DW	DW	DW	DW	DW							OFF

TIMING IN SECONDS															
MINIMUM GREEN					10			8							
VEHICLE EXTENSION					2			2							
MAXIMUM #1 GREEN					23			61							
MAXIMUM #2 GREEN					24			64							
YELLOW CLEARANCE						4			4						
RED CLEARANCE							2			2					
WALK INTERVAL					7*										
PEDESTRIAN CLEARANCE					5**										
MEMORY					NON-LOCK			NON_LOCK							
RECALL (VEH/PED)					MAX			OFF							

\*Ø1 PED SHALL REST IN WALK

\*\*PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS

COORDINATION INFORMATION (TIMES IN SECONDS)							
CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2			HOURS OF OPERATION
1	90	0	28	62			ALL OTHER TIMES
2	100	51	30	70			6:00AM - 10:00AM
3	100	0	30	70			2:30PM - 7:00PM
FLASH OPERATION		-	-	-			EMERGENCY/CONFLICT

BOSTON TRANSPORTATION DEPARTMENT - AUTOMATIC TRAFFIC SIGNALS

OPERATION SCHEDULE

LOCATION: Nashua Street and Martha Road

DESIGN DATE: 10/2009

INTERSECTION No.: 2248

DATE FIRST IN SERVICE: \_\_\_\_\_

SECTION No.: 23

PHASE 1

CLEARANCE TABLE								<div><div><div>↓ ↓</div><div>↓</div></div><div><div>↑ ↑</div><div>↑</div></div></div>								FLASH OPERATION	
TO																	
		G	GV	GL	R	W	DW										
FROM	G	G	-	-	Y	-	-										
	GV	-	GV	-	Y	-	-										
	GL	-	-	GL	Y	-	-										
	R	-	-	-	R	-	-										
	W	-	-	-	-	W	FDW										
DW	-	-	-	-	-	-	DW										

STREET		DIR	FACE	Ø1			Ø2									
MARTHA RD		SB	2A,4A,4B	GV	Y	R	R	R	R							FY
NASHUA ST		WB	3A,5A,6A	R	Y	R	GL	Y	R							FR
CROSSWALK		N/S	2F,3E	W/ FDW	DW	DW	DW	DW	DW							OFF
CROSSWALK		E/W	2E,6E	DW	DW	DW	W/ FDW	DW	DW							OFF

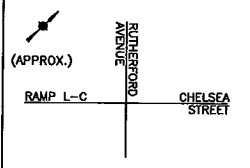
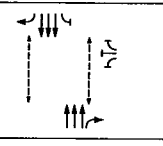
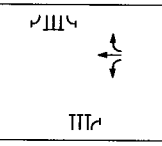
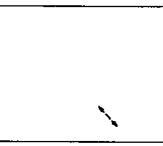
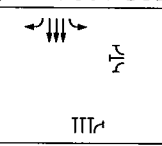
TIMING IN SECONDS															
MINIMUM GREEN				10			8								
VEHICLE EXTENSION				3			3								
MAXIMUM #1 GREEN				22			18								
MAXIMUM #2 GREEN				22			18								
YELLOW CLEARANCE					4			4							
RED CLEARANCE						1			1						
WALK INTERVAL				7*			7								
PEDESTRIAN CLEARANCE				5**			5**								
MEMORY				NON-LOCK			NON-LOCK								
RECALL (VEH/PED)				MAX			OFF								

\*Ø1 PED SHALL REST IN WALK

\*\*PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS

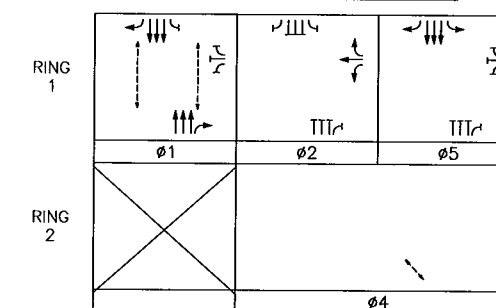
COORDINATION INFORMATION (TIMES IN SECONDS)							
CYCLE	CYCLE LENGTH	OFFSET	Ø1	Ø2			HOURS OF OPERATION
1	50	19	27	23			ALL OTHER TIMES
2	50	0	27	23			6:00AM - 10:00AM
3	50	19	27	23			2:30PM - 7:00PM
FLASH OPERATION		-	-	-			3:00AM - 6:00AM



TIMING AND SEQUENCE CHART																					
																	OPERATION FLASHING				
		ø1			ø2						ø5										
STREET/DIRECTION/FACE		GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL								
RUTHERFORD/NB/2B,6B		GV	Y	R	R	R	R	R	R	R	R	R	R					FY			
RUTHERFORD/NB/7C,7F,7H		GV	Y	R	R	R	R	R	R	R	R	R	R					FY			
RUTHERFORD/NB/11A,12A,12B		G	Y	R	R	R	R	R	R	R	R	R	R					FY			
RUTHERFORD/SB/4A,7A,7B		GV	Y	R	R	R	R	R	R	R	GV	Y	R					FY			
RUTHERFORD/SB/2A,6A		RL	RL	RL	RL	RL	RL	RL	RL	RL	GL	YL	RL					FRL			
CHELSEA/WB/7D		R	R	R	G	Y	R	R	R	R	R	R	R					FR			
CHELSEA/WB/9A		R	R	R	GL	Y	R	R	R	R	R	R	R					FR			
CHELSEA/WB/7E		R	R	R	G	Y	R	R	R	R	R	R	R					FR			
CHELSEA/WB/7G		R	R	R	GV/GR	Y	R	R	R	R	R	R	R					FR			
C.W./N-S/4E,5E,8E,10E		W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW					OFF			
C.W./N-S/11E,13E		DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW					OFF			
INTERSECTIONS	MINIMUM GREEN	10			8			-			8										
	VEHICLE EXTENSION	2			2			-			2										
	MAXIMUM 1 GREEN	27			38			-			26										
	MAXIMUM 2 GREEN	30			50			-			30										
	YELLOW CLEARANCE		3			3					3										
	RED CLEARANCE			2			3			5			2								
	WALK INTERVAL	7*						7													
	PED. CLEARANCE	16**							5**												
MEMORY		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK										
RECALL (VEH./PED.)		MAX			OFF			OFF			OFF										
PROGRAM/COORDINATION																					
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS											HOURS OF OPERATION							
			ø1			ø2,ø4			ø4,ø5												
1	100	35	35			36			29					ALL OTHER TIMES							
2	100	26	31			39			30					6:00 A.M. TO 10:00 A.M.							
3	120	39	29			56			35					2:30 P.M. TO 7:00 P.M.							
COORDINATED OPERATION																					
-----																					
-----																					
PROGRAMMED FLASH																					
EMERGENCY/CONFLICT																					
LOOP DETECTOR DATA										CLEARANCES						TECHNICAL NOTES					
IDENT.	QTY.	SIZE	SPLICE	URNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO								*ø1 PED SHALL REST IN WALK ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.			
									G	GV/GR	GL	GV	R	RL	W	DW					
									G	G	-	-	-	Y	-	-	-				
									GV/GR	-	GV/GR	-	-	Y	-	-	-				
									GL	-	-	GL	-	-	YL	-	-				
									GV	-	-	-	GV	Y	-	-	-				
									R	-	-	-	-	R	-	-	-				
									RL	-	-	-	-	-	RL	-	-				
									-	-	-	-	-	-	-	-	-				
									W	-	-	-	-	-	-	W	FDW				
									DW	-	-	-	-	-	-	-	DW				

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
 DRAWN BY A. SIU  
 CHECKED BY D. MATTON

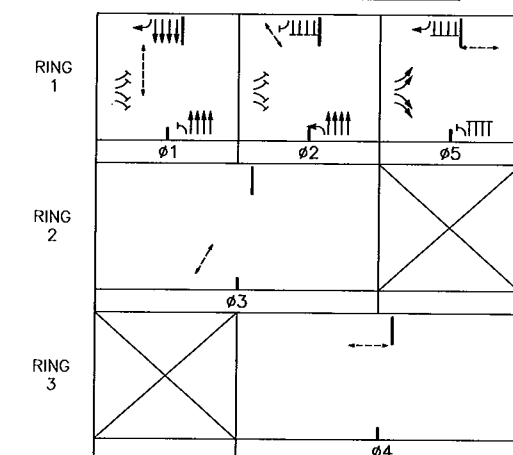
Howard/Stein-Hudson Assoc., Inc.  
 38 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Pfr: 617.482.7080  
 Associates Fax: 617.482.7417

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING  
**N. WASHINGTON / RUTHERFORD / CHELSEA ST.**  
**PHASE 1**  
 BOSTON PROPER  
 INTERSECTION NUMBER 162  
 SCALE: NOT TO SCALE  
 DISTRICT: -  
 AREA: 30  
 DESIGN DATE: OCT. 2009

TIMING AND SEQUENCE CHART																											
<div><div><div><div></div><div></div><div></div><div></div><div></div></div><div>(APPROX.)</div></div><div><div>RAMP T-L</div><div>RUTHERFORD AVENUE</div></div></div>																		OPERATION FLASHING									
			ø1			ø2			ø3			ø4			ø5												
STREET/DIRECTION/FACE			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL										
RUTHERFORD/NB/2B,12A			RL	RL	RL	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL					FRL					
RUTHERFORD/NB/14A,14B			GV	Y	R	GV	Y	R	R	R	R	R	R	R	R	R	R					FY					
RUTHERFORD/SB/2A,6A,6B			GV	Y	R	R	R	R	R	R	R	R	R	R	R	R	R					FY					
RUTHERFORD/SB/8A,8B			GR	Y	R	R	R	R	R	R	R	R	R	R	GR	Y	R					FY					
RUTHERFORD/SB/10A			GR	YR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	GR	YR	RR					FYR					
RAMP T-L/EB/7A,14C,15A			R	R	R	R	R	R	R	R	R	R	R	R	GL	Y	R					FR					
RAMP T-L/EB/3A,3B,5A			R	R	R	R	R	R	R	R	R	R	R	R	GR	Y	R					FR					
C.W./N-S/4E,5E			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW					OFF					
C.W./N-S/6E,10E			W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW					OFF					
C.W./N-S/9E,11E			DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW					OFF					
C.W./E-W/11F,12F			DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW					OFF					
C.W./E-W/12E,13E			DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW					OFF					
INTERSECTIONS	MINIMUM GREEN		10				8				-				8												
	VEHICLE EXTENSION		2				2				-				2												
	MAXIMUM 1 GREEN		38				26				-				27												
	MAXIMUM 2 GREEN		41				30				-				36												
	YELLOW CLEARANCE			3		3						3															
	RED CLEARANCE				2		2		5		5		2														
	WALK INTERVAL		7			7			7*			7															
	PED. CLEARANCE		13**			5**			5**			8**		10**													
MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK												
RECALL (VEH./PED.)			MAX			OFF			PED			OFF			OFF												
PROGRAM/COORDINATION																											
PHASE SPLITS IN SECONDS																											
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	ø1,ø3			ø2,ø3,ø4			ø4,ø5									HOURS OF OPERATION									
1	100	0	42			35			23									ALL OTHER TIMES									
2	100	0	41			26			33									6:00 A.M. TO 10:00 A.M.									
3	120	0	46			33			41									2:30 P.M. TO 7:00 P.M.									
COORDINATED OPERATION																		EVERYDAY									
----																		-----									
----																		-----									
PROGRAMMED FLASH																		3:00 A.M. TO 6:00 P.M.									
LOOP DETECTOR DATA									CLEARANCES									TECHNICAL NOTES									
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO									* ø3 PED SHALL REST IN WALK DURING CO-ORD ø1. ** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.								
									G	GV	GL	GR	R	RL	RR	W	DW										
									G	G	-	-	-	Y	-	-	-										
									GV	-	GV	-	-	Y	-	-	-										
									GL	-	-	GL	-	Y	YL	-	-										
									GR	-	-	-	GR	Y	-	YR	-										
									R	-	-	-	-	R	-	-	-										
									RL	-	-	-	-	-	RL	-	-										
									RR	-	-	-	-	-	-	RR	-										
									W	-	-	-	-	-	-	-	W										
									DW	-	-	-	-	-	-	-	DW										

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
 DRAWN BY A. SIU  
 CHECKED BY D. MATTON

Howard/Stein-Hudson Assoc., Inc.  
 38 Chauncy St., 9th Floor  
 Boston, MA 02111  
 Ph: 617.482.7080  
 Fax: 617.482.7417

CITY OF BOSTON TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION  
 TRAFFIC SIGNAL TIMING AND PHASING  
**RUTHERFORD AVE. & RAMP T-L**  
**PHASE 1**  
 BOSTON PROPER  
 INTERSECTION NUMBER 2345  
 SCALE: NOT TO SCALE  
 DISTRICT: -  
 AREA: 30  
 DESIGN DATE: OCT. 2009

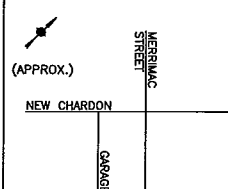
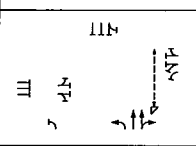
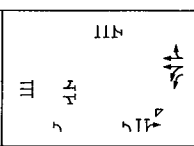

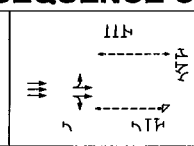
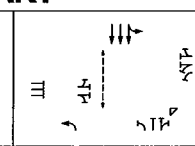
## OPERATION SCHEDULE

DESIGN DATE: 10/2009

DATE FIRST IN SERVICE: \_\_\_\_\_

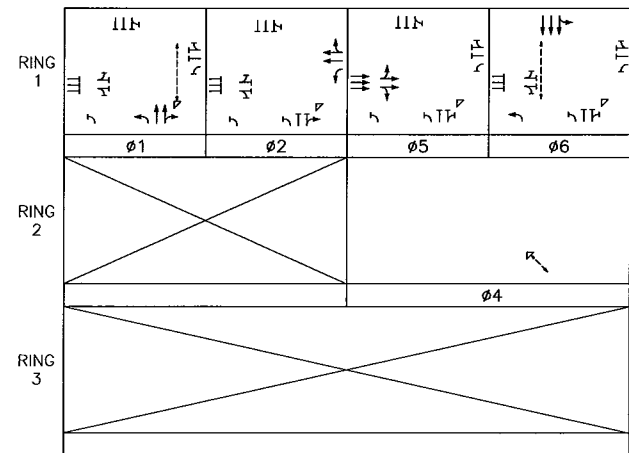
## PHASE 1

CLEARANCE TABLE											PHASE 1			PHASE 2			PHASE 3			FLASH OPERATION		
TO																						
FROM	G	GV	GL	GR	GSL	R	-	W	DW													
	G	GV	-	-	-	Y	-	-	-													
	GV	-	GV	-	-	Y	-	-	-													
GL	-	-	GL	-	-	Y	-	-	-													
GR	-	-	-	GR	-	Y	-	-	-													
GSL	-	-	-	-	GSL	Y	-	-	-													
R	-	-	-	-	-	R	-	-	-													
-	-	-	-	-	-	-	-	-	-													
W	-	-	-	-	-	-	-	W	FDW													
DW	-	-	-	-	-	-	-	-	-													
STREET			DIR	FACE			Ø1			Ø2			Ø3									
FRONTAGE RD			NB	7B,7C			G	Y	R	R	R	R	R	R	R							
FRONTAGE RD			NB	7D			GV	Y	R	R	R	R	R	R	R			FY				
ALBANY CONN.			WB	7A,7G			R	R	R	R	R	R	GR	Y	R			FY				
ALBANY CONN.			EB	3A,9A			R	R	R	GV	Y	R	R	R	R			FR				
ALBANY CONN.			EB	4A,8A			R	R	R	GSL	Y	R	R	R	R			FR				
ALBANY CONN.			EB	5A			R	R	R	GL	Y	R	G	Y	R			FR				
ALBANY CONN.			EB	6A			R	R	R	G	Y	R	R	R	R			FR				
CROSSWALK			N/S	3F,4E			W/FDW	DW	DW	DW	DW	DW	DW	DW	DW			OFF				
CROSSWALK			E/W	2E,3E			DW	DW	DW	W/FDW	DW	DW	DW	DW	DW			OFF				
TIMING IN SECONDS																						
MINIMUM GREEN							10			8			8									
VEHICLE EXTENSION							3			2			2									
MAXIMUM #1 GREEN							39			44			10									
MAXIMUM #2 GREEN							45			47			11									
YELLOW CLEARANCE								4			3			4								
RED CLEARANCE									2			2			2							
WALK INTERVAL							12*			7												
PEDESTRIAN CLEARANCE							7**			8**												
MEMORY							NON-LOCK			NON-LOCK			NON-LOCK									
RECALL (VEH/PED)							MAX			OFF			OFF									
Ø1 PED SHALL REST IN WALK																						
PED INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE CLEARANCE INTERVALS																						
COORDINATION INFORMATION (TIMES IN SECONDS)																						
CYCLE	CYCLE LENGTH		OFFSET	Ø1	Ø2	Ø3	HOURS OF OPERATION															
1	100		48	40	43	17	ALL OTHER TIMES															
2	120		50	51	52	17	6:00AM - 10:00AM															
3	110		4	45	51	14	2:30PM - 7:00PM															
FLASH OPERATION			-	-	-	-	EMERGENCY/CONFLICT															

TIMING AND SEQUENCE CHART																									
																								OPERATING FLASHING	
STREET/DIRECTION/FACE			ø1			ø2			ø4			ø5			ø6										
MERRIMAC ST/NB/2H			GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL					FRL			
MERRIMAC ST/NB/2K,2M			GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL					FY			
MERRIMAC ST/NB/12A,14A			GV	Y	R	R	R	R	R	R	R	R	R	R	R	R	R					FYSR			
MERRIMAC ST/SB/2G			GSR	YSR	RSR	GSR	YSR	RSR	RSR	RSR	RSR	RSR	RSR	RSR	RSR	RSR	RSR					FYSR			
MERRIMAC ST/SB/2A			R	R	R	R	R	R	R	R	R	R	R	R	GV/GL	Y	R					FY			
MERRIMAC ST/SB/2A			R	R	R	R	R	R	R	R	R	R	R	R	GV	Y	R					FY			
NEW CHARDON/EB/2B,2D			R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R					FR		
NEW CHARDON/EB/4A,4B			R	R	R	R	R	R	R	R	R	GV	Y	R	R	R	R	R					FR		
NEW CHARDON/WB/2C			RL	RL	RL	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL					FRL		
NEW CHARDON/WB/2J,2L			R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R					FR		
GARAGE/NB/4C,5A			RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	GL	YL	RL					FRL			
C.W./2E,15E			W/FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW					OFF			
C.W./13E,14E			DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW					OFF			
C.W/8E,6F			DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW					OFF			
C.W./15F,16E			DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW					OFF			
C.W./3E,6E			DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW					OFF			
INTERVALS	MINIMUM GREEN	7				7				—				10				1							
	VEHICLE EXTENSION	2				2				—				2				2							
	MAXIMUM 1 GREEN	21				13				—				20				19							
	MAXIMUM 2 GREEN	22				16				—				20				21							
	YELLOW CLEARANCE		3				3				6				3				3						
	RED CLEARANCE					3				6				3				3							
	WALK INTERVAL	7*								7				7				7							
	PED. CLEARANCE	13**								5**				12**				8**							
MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK										
RECALL (VEH./PED.)			MAX/PED			OFF			PED			PED			PED										
PROGRAM/COORDINATION																									
CYCLE NO.	CYCLE LENGTH	OFFSET (SEC.)	PHASE SPLITS IN SECONDS																	HOURS OF OPERATION					
			ø1			ø2			ø4,ø5			ø4,ø6													
1	90	33	26			14			26			24									ALL OTHER TIMES				
2	100	64	28			22			26			24									6:00 A.M. TO 10:00 A.M.				
3	100	65	27			20			26			27									2:30 P.M. TO 7:00 P.M.				
COORDINATED OPERATION																					EVERYDAY				
PROGRAMMED FLASH																					EMERGENCY/CONFLICT				
LOOP DETECTOR DATA									CLEARANCES									TECHNICAL NOTES							
IDENT.	QTY.	SIZE	SPLICE	TURNS	MODE	øCALL	øEXT.	CHNL.	FROM	TO								* ø1 PED SHALL REST IN WALK.							
									G	G	GV/GL	GL	GSR	GV	R	W	DW	** PEDESTRIAN INDICATION SHALL NOT DISPLAY FDW THROUGH CONCURRENT VEHICLE YELLOW AND RED CLEARANCE INTERVALS.							
									GV/GL	—	GV/GL	—	—	—	Y	—	—								
									GL	—	—	GL	—	—	YL	—	—								
									GSR	—	—	—	GSR	—	Y	—	—								
									GV	—	—	—	—	GV	Y	—	—								
									R	—	—	—	—	—	R	—	—								
									W	—	—	—	—	—	—	W	FDW								
									DW	—	—	—	—	—	—	—	DW								

S/P = SERIES/PARALLEL

## PHASING DIAGRAM



DESIGNED BY A. SIU  
DRAWN BY A. SIU  
CHECKED BY D. MATTON

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CITY OF BOSTON TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION  
TRAFFIC SIGNAL TIMING AND PHASING  
**NEW CHARDON ST. & MERRIMAC ST.**  
**PHASE 2**  
BOSTON PROPER  
INTERSECTION NUMBER 311  
SCALE: NOT TO SCALE  
DISTRICT: —  
AREA: GC  
DESIGN DATE: OCT. 2009

## Appendix E. List of Intersection Improvements

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List of Intersection Improvements

Intersection	Existing Cycle Lengths			Proposed Cycle Lengths			Phase 1 Changes					Phase 2 Changes			
	AM	Mid-day	PM	AM	Mid-day	PM	Splits/ Offsets	Vehicle Clearances	Walk Time	FDW Time	Signage	Phase Changes	Lane Usage	Physical Changes	Other
Pearl Street/Atlantic Avenue	100	90	100	100	90	100	•			•					
Pearl Street/Purchase Street	100	90	100	100	90	100	•	•							
Seaport Boulevard/Atlantic Avenue	100	90	100	100	90	100	•	•		•				•	
Oliver Street/ Purchase Street	100	90	100	100	90	100	•	•							
High Street/Atlantic Avenue	90	90	100	100	90	100	•	•		•					
High Street/Purchase Street	90	90	100	100	90	100	•	•		•					
Broad Street/Purchase Street	90	90	100	100	90	100	•	•		•					
East India Row/Atlantic Avenue	90	90	100	100	90	100	•	•	•						
India Street/SASB)	90	90	100	100	90	100	•	•		•					
Milk Street/Atlantic Avenue	90	90	100	100	90	100	•	•		•					
Milk Street/SASB	90	90	100	100	90	100	•	•							
State Street/Atlantic Avenue	90	90	100	100	90	100	•	•		•					
State Street/SASB	90	90	100	100	90	100	•	•		•					
Mercantile Street/Atlantic Avenue/Cross Street	90	90	100	100	90	100	•								
Mercantile Street/SASB	90	90	100	100	90	100	•	•							
Commercial Street/Cross Street	90	90	100	100	90	100	•		•						
Clinton Street/SASB	90	90	100	100	90	100	•								
Kneeland Street/SASB	100	90	100	100	90	100	•								
Beach Street/SASB	100	90	100	100	90	100	•	•							
Essex Street/Lincoln Street/SASB	100	90	100	100	90	100	•				•			•	
Essex Street/South Street	100	90	100	100	90	100	•								
Summer Street/Purchase Street/SASB	100	90	100	100	90	100	•								
Congress Street/Purchase Street	100	90	100	100	90	100	•				•			•	
Kneeland Street/Lincoln Street	100	90	100	100	90	100	•			•					
North Street/SASB	90	90	100	100	90	100	•	•	•						
North Street/Cross Street	100	90	100	100	90	100	•								
Hanover Street/SASB	100	90	100	100	90	100	•			•					
Hanover Street/Cross Street	100	90	100	100	90	100	•			•					
New Sudbury Street/SASB	100	90	100	100	90	100	•	•		•					
New Sudbury Street/Cross Street	100	90	100	100	90	100	•	•		•					
New Chardon Street/SASB	100	90	100	100	90	100	•	•		•					
North Washington Street/Cross Street	100	90	100	100	90	100	•	•		•					
North Washington Street/Beverly Street	100	90	100	100	90	100	•								
Valenti Way/Beverly Street	-	-	-	-	-	-									
Valenti Way/ North Washington Street	100	90	100	100	90	100	•						•	•	
Congress Street/Atlantic Avenue	100	90	100	100	90	100	•	•		•					
Summer Street/Atlantic Avenue	100	90	100	100	90	100	•	•							
Essex Street/Atlantic Avenue	100	90	100	100	90	100	•			•					
Beach Street/Atlantic Avenue	100	90	100	100	90	100	•								
Kneeland Street/Atlantic Avenue/I-93 Ramps	100	90	100	100	90	100	•	•							
North Street/Clinton Street	100	90	100	100	90	100	•	•							
Purchase Street/Fire Station	-	-	-	-	-	-									
State Street/Congress Street/Devonshire Street	90	90	100	100	90	100	•	•		•					
North Street/Congress Street	100	90	100	100	90	100	•	•		•					
North Street/Union Street	100	90	100	100	90	100	•								
Hanover Street/Congress Street	100	90	100	100	90	100	•								
New Sudbury Street/Congress Street/ Merrimac Street	100	90	100	100	90	100	•	•				•	•		
New Chardon Street/Merrimac Street	100	90	100	100	90	100	•	•		•					
Summer Street/Dorchester Avenue	100	90	100	100	90	100	•								
Summer Street/Melcher Street	100	90	100	100	90	100	•								
Summer Street/Pump House Road	100	90	100	100	90	100	•								
Massport Haul Road/Pump Station Connector	100	90	100	100	90	100	•	•							
Summer Street/D Street	100	90	100	100	90	100	•	•							
Ramp DB (I-90 WB On Ramp)/D Street	100	90	100	100	90	100	•	•		•					
Transitway/D Street	100	90	100	100	90	100	•	•	•						
Congress Street/D Street	100	90	100	100	90	100	•	•							
Congress Street/B Street/Ramps D & F	100	100	100	100	90	100	•	•		•					
Congress Street/East Service Road/Ramps I & C	100	90	100	100	90	100	•	•		•					
Congress Street/Boston Wharf Road	100	90	100	100	90	100	•			•					
Seaport Boulevard(Northern Avenue)/B Street	100	90	100	100	90	100	•	•		•		•	•	•	
Seaport Boulevard/East Service Road	100	90	100	100	90	100	•	•		•					
Seaport Boulevard/Sleeper Street	100	90	100	100	90	100	•	•	•	•					
Congress Street/Dorchester Avenue	90	90	100	100	90	100	•	•							
Congress Street/A Street	100	90	100	100	90	100	•	•		•					
Summer Street/West Side Drive	100	90	100	100	90	100	•	•				•			
Summer Street/WTC Avenue	100	90	100	100	90	100	•	•				•			
Seaport Boulevard/Boston Wharf Road	100	90	100	100	90	100	•	•				•			
SSCONN/Albany Street	100	90	100	100	90	100	•								
Broadway Bridge/Frontage Road NB	100	90	100	120	100	110	•	•	•	•				•	
Bennington Street/Neptune Road	120	120	120	110	100	120	•	•							
SSCONN/Ramps K&X	100	90	100	100	90	100	•	•		•					
East Berkeley Street/Albany Street	100	90	100	120	100	110	•	•							
West 4 <sup>th</sup> Street/Frontage Road NB	100	90	100	120	100	110	•	•						•	
Traveler Street/Albany Street	100	90	100	120	100	110	•	•							
Herald Street/Albany Street	80	90	100	80	90	100	•								
Albany Street/Frontage Road SB	100	80	100	120	100	110	•								
Ramp A2/Ramp I/Frontage Road SB	100	90	100	100	90	100	•								
Martha Road/Nashua Street	90	90	100	50	50	50	•								
Street	100	90	100	100	100	120	•	•		•					
Rutherford Avenue/LT-TL	100	90	100	100	100	120	•								
Albany Street Extension/Frontage Road NB	100	90	100	120	100	110	•		•		•				
Neptune Road/Route 1A Off-ramp	120	90	100	110	100	120	•								